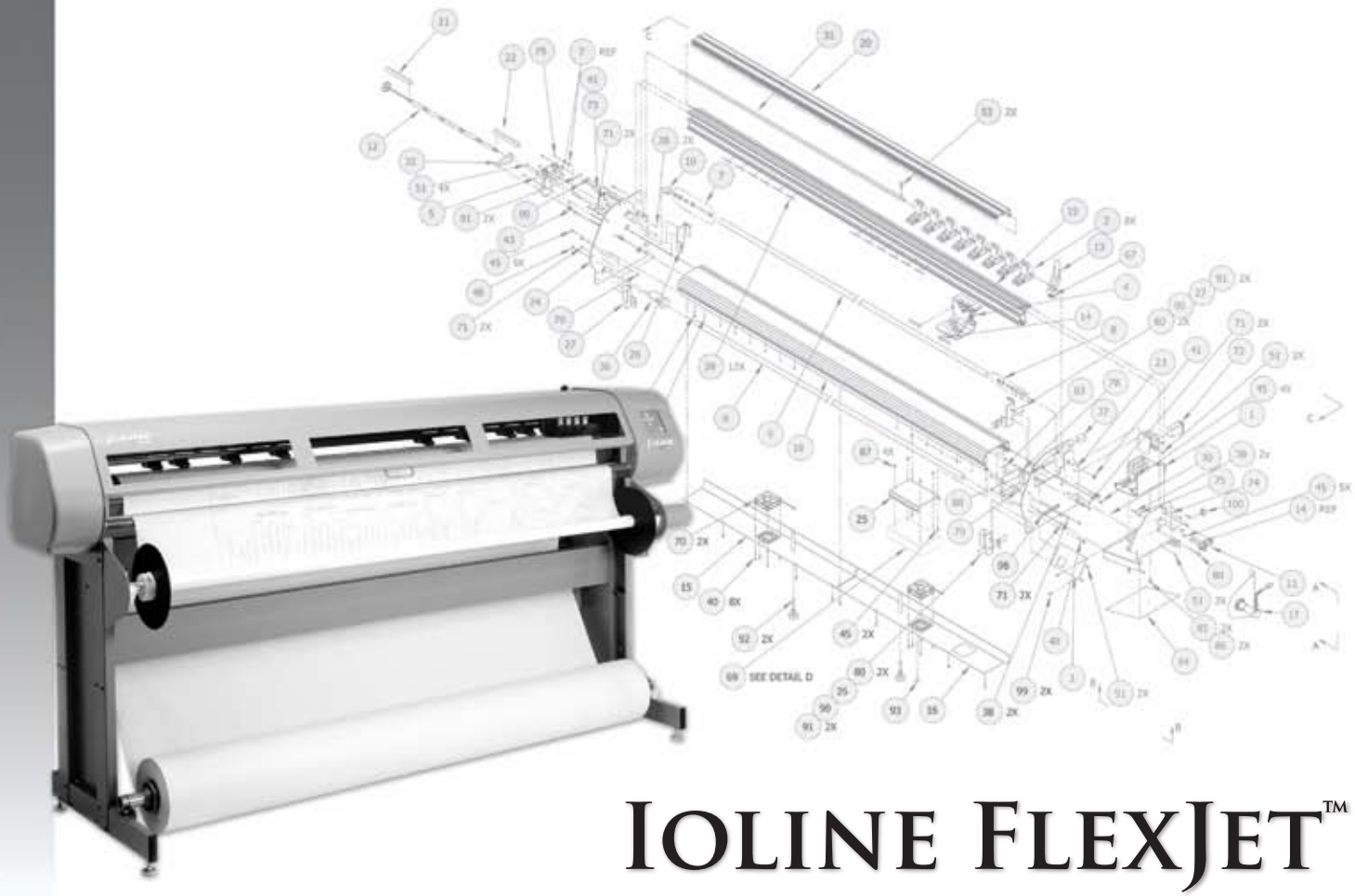
IOLINE™

Service Manual



IOLINE FLEXJET™

User Notice

Trademarks
Ioline and FlexJet are trademarks of Ioline Corporation. HP is a trademark of the Hewlett-Packard Company. Other product names, logos, designs, titles, words or phrases mentioned within this publication may be trademarks, service marks, or trade names of Ioline Corporation or other entities and may be registered in certain jurisdictions including internationally.

Ioline Disclaimer
IOLINE CORPORATION PROVIDES THIS MANUAL "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OR CONDITIONS OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL IOLINE, ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF USE OR DATA, INTERRUPTION OF BUSINESS AND THE LIKE), EVEN IF IOLINE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES ARISING FROM ANY DEFECT OR ERROR IN THIS MANUAL OR PRODUCT.

Limit of Liability Statement
This manual is provided for informational purposes only. The contents are subject to change without notice and Ioline Corporation assumes no responsibility for any errors that may be contained herein.

Ioline has made every effort to make the FlexJet easy to operate, maintain, and repair. It is the responsibility of the operator of the printer to monitor the performance of the printer and maintain it in proper working condition by following the instructions in this manual and in the FlexJet User Guide and to follow all safety precautions and warnings that are described in these publications. Ioline Corporation is not responsible for injuries that may occur as a result of unsafe use. Ioline Corporation is not responsible for substandard operational performance as a result of failure to maintain the printer as described in this manual and in the FlexJet User Guide.

© 2003-2005 Ioline Corporation. All rights reserved. This manual may not be copied, photocopied, reproduced, translated, transmitted or converted to any electronic or machine-readable form in whole or in part without prior written approval of Ioline Corporation.

Service and Support
If you require assistance with an Ioline product, your local Ioline dealer or authorized service center is ready to help. Support information is also available 24/7 on the Ioline Web site—or you may contact Ioline directly:

Ioline Corporation
14140 NE 200th Street
Woodinville, Washington 98072 U.S.A.

Ioline Customer Service Department
Monday through Friday
7:00 A.M. - 5:00 P.M. U.S. Pacific Time
Voice: 1.425.398.8282
Fax: 1.425.398.8383
support@ioline.com
www.ioline.com

Part Number: (File) 108675 Rev. 0

IOLINE FLEXJET™

Service Manual

Images & Illustrations

Figure 1. Proper lifting procedures for the FlexJet xiii
Figure 2. The Ioline FlexJet Printer front view xvi
Figure 3. The Ioline FlexJet Printer rear view xvii
Figure 4. The Ioline FlexJet Printer front view close-up xviii
Figure 5. The Ioline Flexjet 19
Figure 6. Paper direction 21
Figure 7. Carriage movement 21
Figure 8. Workflow: output direct from CAD software (without FlexPlot) 23
Figure 9. Workflow using **FlexPlot** for file conversion and output 23
Figure 10. FlexJet **Control Center** main menu 25
Figure 11. The Ioline Flexjet power supply 29
Figure 12. Rear power panel assembly 29
Figure 13. Service Station assembly 30
Figure 14. Pinchwheel assembly 30
Figure 15. Ink cartridges: HP 51645A 30
Figure 16. FlexJet logic board (Rev 1, above; Rev 2 below) 31
Figure 17. Carriage assembly with cover on 32
Figure 18. Carriage assembly with cover off 32
Figure 19. **LED lights** on the keypad 36
Figure 20. **Keypad LED error codes** 36
Figure 21. The correct paper feeding path on the Ioline FlexJet Printer 42
Figure 22. **HP cartridges have an ink level indicator** 44
Figure 23. The ink cartridge is dirty, dry, or empty 44
Figure 24. The ink cartridge requires cleaning 45
Figure 25. Damaged and dirty print cartridge 45
Figure 26. Use a deliberate frame gap to help calibrate 46
Figure 27. The **Cartridge Calibration** window in the **Control Center** 47
Figure 28. The Cartridge Alignment dialog box 47
Figure 29. Increase the alignment value for cartridge #2 to improve line quality 47
Figure 30. Decrease the alignment value for cartridge #2 to improve line quality 47
Figure 31. The Motion Adjust window 48
Figure 32. The heads are drawing the lines too late on this plot 48
Figure 33. The Frame Gap window 48
Figure 34. Frame gaps on the plot 49
Figure 35. Frame gaps may indicate that the FlexJet platen or stand is not level 49
Figure 36. The height-adjusting spacer 49
Figure 37. The ink stall can crack if the cartridge door is not closed and locked 50

Figure 38. Carriage noise may indicate a dirty or faulty wheel 50
Figure 39. Replacing the fuse 51
Figure 40. A good transitor on the left; the one on the right is blown 52
Figure 41. Testing the Y-Axis motor 54
Figure 42. Mechanical, electrical and electronic diagnostics flow chart 61
Figure 43. Removing the right end cover 64
Figure 44. Loosen the belt tensioner 64
Figure 45. The carriage cover screw 65
Figure 46. Unclip the belt from both ends of the carriage 65
Figure 47. Loosen the carriage wheel lock 66
Figure 48. Gently press down on the carriage 66
Figure 49. Rotate the v-wheels free of the traverse rail 66
Figure 50. Carriage installation 67
Figure 51. Use the spacer when attaching each swing arm 67
Figure 52. The carriage belt tensioner 68
Figure 53. Install the carriage cover 68
Figure 54. Remove the cover 69
Figure 55. Install the carriage cover 70
Figure 56. Remove the logic board cover plate 70
Figure 57. Unplug the feed motor and encoder cables from the logic board 71
Figure 58. Unplug the ribbon cables 71
Figure 59. Make a loop in the ribbon cable to the left of the carriage 72
Figure 60. Carriage installation 73
Figure 61. The carriage belt tensioner 73
Figure 62. Install the carriage cover 74
Figure 63. There should be a small gap in the ribbon cable loop 75
Figure 64. The loop in the cable should not touch the left endplate 75
Figure 65. Secure the sleeving with tape 76
Figure 66. Remove the right end cover 77
Figure 67. Remove the screws and let the keypad hang 77
Figure 68. Remove the carriage cover 77
Figure 69. Install the ink cartridges and turn the power on 78
Figure 70. Loosen the carriage catch bracket 78
Figure 71. Cover the spit wells 78
Figure 72. Two lines in the spit well holes 79
Figure 73. Use the plastic thumbscrew to adjust the lines if necessary 79
Figure 74. Y Fine adjustment is performed within the **Control Center** 80
Figure 75. Watch the gap between the carriage and **Service Station** 80
Figure 76. The **Service Station** stop screw 81
Figure 77. Small gap between the screw and the **Service Station** 82
Figure 78. Tighten the nut to hold the stop bracket 82
Figure 79. Unplug the take-up motor 83
Figure 80. Remove the right cover 83
Figure 81. Unscrew the PCB cover 83

Figure 82. Remove the logic board cover 83
Figure 83. Carefully unplug connections to the board 84
Figure 84. Carefully remove the logic board 84
Figure 85. Inspect the connections to the logic board 85
Figure 86. Remove the keypad screws and bracket. Unplug the keypad cable 87
Figure 87. Tighten the screws on the Y-Axis transmission 88

Table of Contents

Safety & Cautions

Warranty Policy

Ioline warranty policy ..... **xiv**

How to use this manual

Where to find information xv
What's in this ***Service Manual*** ..... ***xv***

Visual Reference Guide

Chapter 1 Overview

Product overview 19
Supported languages 19
Specifications 20
How the FlexJet works 21
Paper movement 21
Carriage movement 21
Serial number identification 21
Glossary 22
Software setup options 22
Power on 24
Installing FlexPlot and the Control Center 24
The FlexJet Control Center 25
Overview 25
Changing system settings 25
Control Center menu bar features 26
File 26
Communications 26
Tools 26
Help 26
Control Center menu options 27
Software Version 27
Cartridge Count 27
Get Plotter Data 27
Plotter Data (check box) 27
Line Width 27
Scale 27
Frame Size 27

Quality Setting 28
Measurement Units 28

CHAPTER 2 **Nomenclature**
Product components 29
General troubleshooting 33
Error messages 33

CHAPTER 3 **Troubleshooting & Testing**
Control Center software errors 34
Keypad error codes 36
Legend 36
Power problems 37
Communications 37
The FlexJet won't respond to the computer 37
Serial communication 37
Common problems 38
Paper problems 42
Regular or intermittent paper tearing 42
Media tracking 43
Print quality problems 44
Line quality 44
Dirty or damaged cartridge 45
Cartridge calibration 46
Calibration overview 46
Cartridge alignment 46
Adjusting the cartridge alignment value 47
Motion adjustment 48
Frame gap 48
Unexplained frame gaps 49
Ink cartridge stall problems 50
Noisy carriage movement 50
Mechanical, electrical, and electronic diagnostics 51
No power to the FlexJet 51
Electrical problems 52
Troubleshooting sensors 52
General mechanical / electrical issues 53
Simple electrical diagnostics test: 54
Motor problems 54
Testing a motor 54
Logic board assembly troubleshooting 55
Logic board troubleshooting steps (Revision 2) 56
Service & support 58
Getting help 58
Customer service 59

CHAPTER 4 **Repair Procedures**
Maintenance procedures 61
Repair procedures 61
Requesting service 62

Carriage procedures 63
FlexJet carriage replacement 63
FlexJet Cable replacement 69
Service station procedures 77
Y Fine adjustment for the Service Station 77
Logic Board Procedures 83
Logic board replacement 83
Updating the firmware 86
Keypad procedures 87
Keypad replacement 87
Y-Axis procedures 88
Y-Axis belt adjustment 88
X-Axis procedures 89

CHAPTER 5 **Parts & Drawings**
FlexJet BOM (Bill of Materials) 91
Ioline FlexJet (Exploded view) 94
Ioline FlexJet (Electronics view) 95

INDEX

Safety & Cautions

The Ioline FlexJet has many fast moving components. To avoid injury and prevent electrical shock, please read and follow these safety guidelines before attempting to service the printer:

- ***Do not try to repair the machine without factory authorization.*** Only qualified service personnel should attempt any of the subsystem testing or replacement procedures that are described in this manual. If external mechanical adjustments are necessary, turn off the printer and disconnect it from all power sources (both the computer and the wall outlet).

- Unless otherwise noted, all subsystem testing or replacement procedures must be performed with the FlexJet turned off and the power cord removed from the rear panel to avoid the possibility of electrical shock.

- Before beginning any subsystem testing or replacement procedure, make sure that the FlexJet is on a flat, stable, clean, and dry surface.

- ***Keep fingers, hair, and clothing well clear of the FlexJet whenever moving parts are being tested.***

Figure 1. Lift the printer head using the gray bars to avoid injury to your fingers.

- ***Be careful when moving or lifting the printer.*** Moving the printer requires at least 2 people. To avoid injury to your fingers, do not lift the printer by the end covers. Hold the gray bars on the printer to lift or move it. *See* ***Figure 1***.

Warranty Policy

Ioline warranty policy

Ioline Corporation provides a 12 month parts and labor warranty on all new equipment and 90 days on repaired units, unless specifically noted otherwise. Every unit is recorded by serial number when it leaves the factory. The warranty period is based on the serial number of the unit and extends from the date of manufacture up to 12 months, plus an extra 3 months for shelf life. Making the total warranty period 15 months from the date of manufacture.

For warranty service, the end user must work through their dealer. Ioline Customer Service is available to assist Authorized Dealers with customer and equipment support.

How to use this manual

Four publications are available to assist you in setting up, operating maintaining and servicing the FlexJet:

- *FlexJet Quick Start Guide*
- *FlexJet User Guide*
- *FlexJet Service Manual*
- *FlexPlot User Guide*

Where to find information

The table below provides a quick directory of topics and resources:

Topic	Manual
Assembly & setup	***FlexJet Quick Start Guide***
Paper loading	***FlexJet Quick Start Guide***
Removing markers	***FlexJet User Guide***
The Ioline **Control Center (**adjusting plot parameters)	***FlexJet User Guide***
Ioline **FlexPlot** software	***FlexPlot User Guide***
Design software set-up guides	***FlexPlot User Guide***
Maintenance	***FlexJet User Guide***
Basic troubleshooting	***FlexJet User Guide***
Advanced troubleshooting for qualified service personnel	***FlexPlot Service Manual***
Specifications, part names, drawings	***FlexPlot Service Manual***

What's in this *Service Manual*

The *FlexJet Service Manual* provides extensive product specifications, testing and repair procedures.

Chapter 1 Introductory information and general specifications.

Chapter 2 Descriptive drawings listing part names for the FlexJet. This section is intended to supplement the *FlexJet User's Guide*.

Chapter 3 Troubleshooting and testing guide.

Chapter 4 Details for repair and maintenance of the FlexJet.

Chapter 5 Technical drawings and reference material.

KEY

A.	Left End Cover	**F.**	Feed Roll
B.	Safety Cover	**G.**	Take-up Shaft
C.	Right End Cover	**H.**	Paper Hub (2)
D.	Take-up Motor	**I.**	Feed Shaft
E.	Stand Leveling Foot	**J.**	Support Block (2)

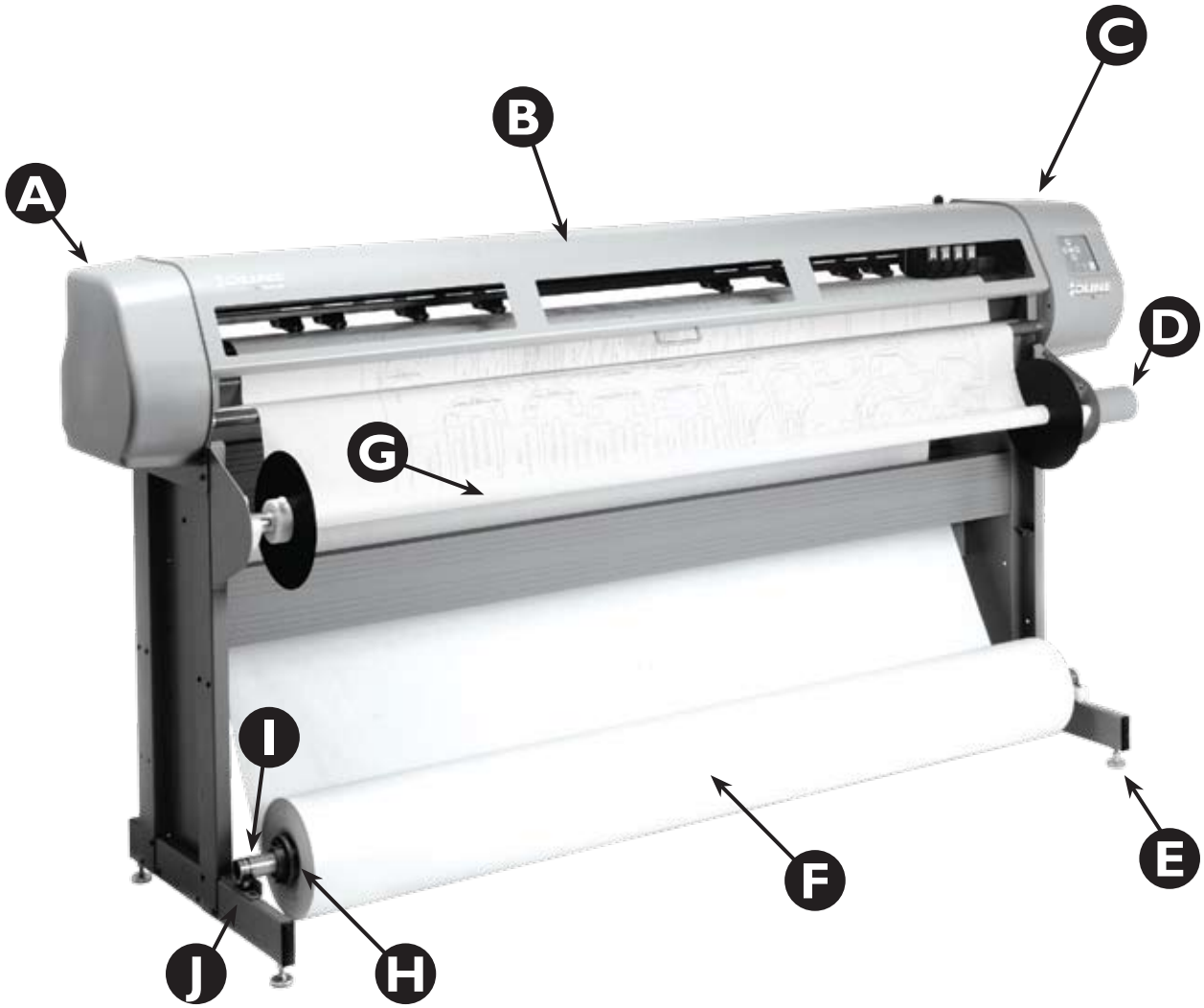


Figure 2. The Ioline FlexJet Printer front view.

KEY

K. Stand Leg (2)
L. Take-up Motor Cable
M. Take-up Motor Outlet
N. Serial & USB Ports
O. Power Switch and fuse
P. Platen Leveling Foot
Q. Cross-member (3)

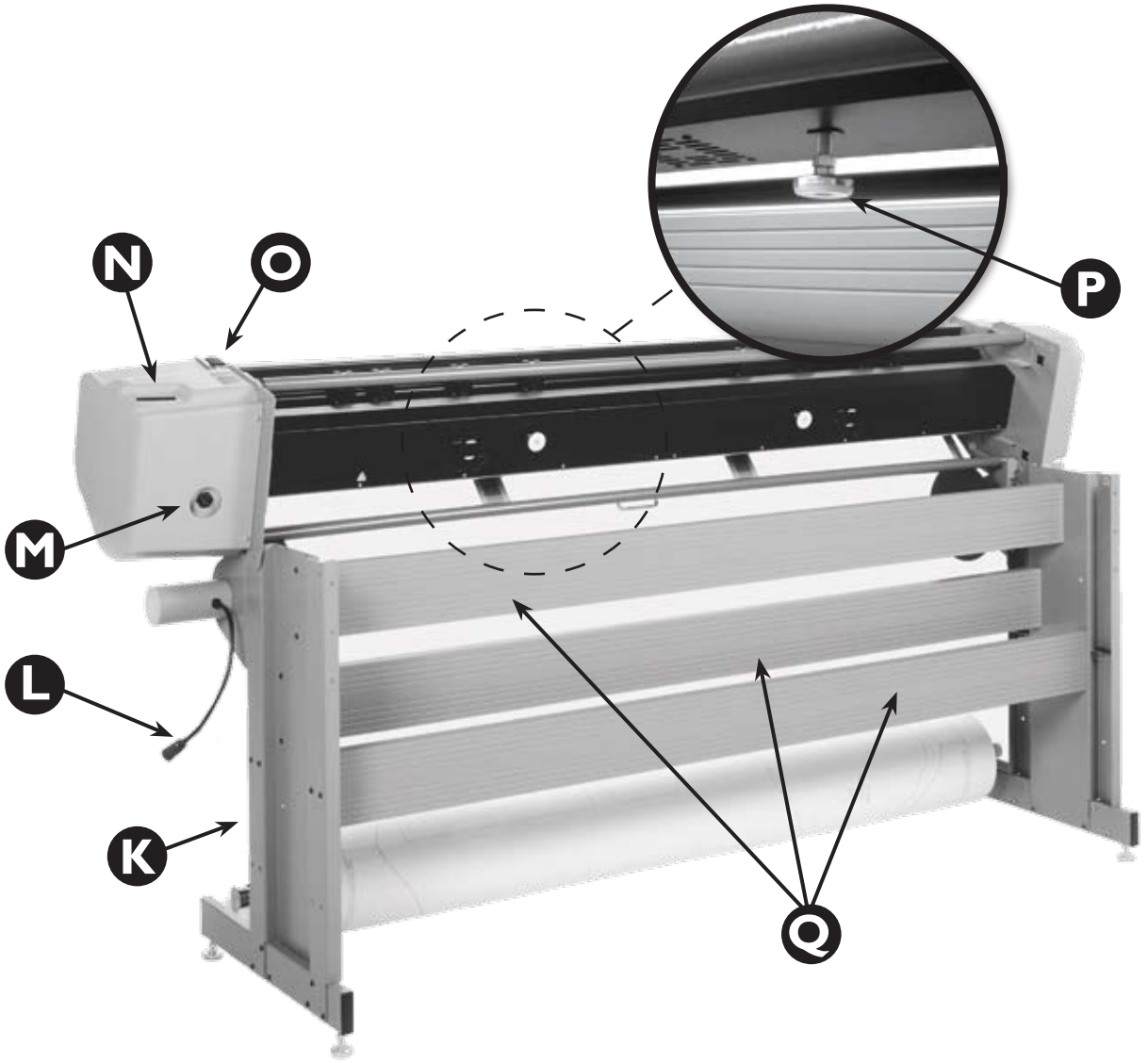


Figure 3. The Ioline FlexJet Printer rear view (head tilted in maintenance position.)

KEY

R. Ink Cartridge Stall
S. Cartridge Stall Latch
T. Pinchwheel Lever
U. Keypad
V. Service Station (Beneath Cover)
W. Take-up Sensor
X. Platen
Y. Pinchwheel
Z. Drive Shaft Marker
aa. Traverse
ab. Carriage Assembly

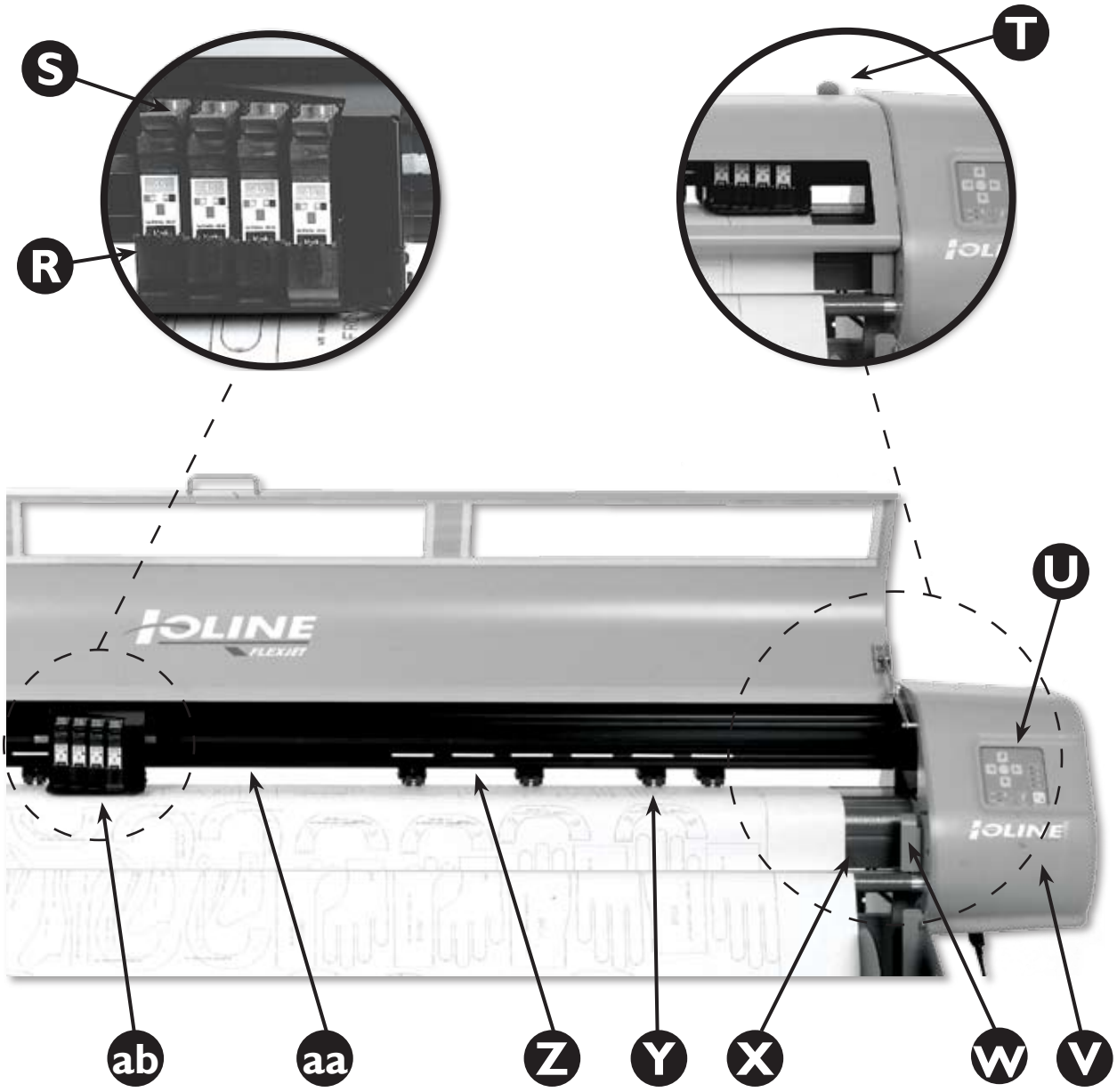


Figure 4. The Ioline FlexJet Printer front view close-up (safety cover lifted for clarity.)

Chapter 1

Overview

Product overview

Figure 5. The Ioline Flexjet.

The FlexJet is most commonly used in conjunction with popular apparel software for printing marker patterns, used in the manufacture of clothing. The FlexJet also comes with **FlexPlot** software that allows printing of the most popular formats such as AutoCad® (DXF), CorelDraw!® (PLT), Adobe® Illustrator® (DXF), Gerber® (STD, PLT or ASTM), Lectra® (ASTM), Investronica® (ASTM).

The Ioline FlexJet can handle many different printing operations up to 72 inches wide and 600 yards long. Three industry standard printer languages (HPGL 7475, and DM/PL) are supported.

The Ioline FlexJet also supports direct cable connection from many popular programs such as PAD®, Scanvec® Optitex®, Polytropon®, Ioline IPS software, and other applications.

Supported languages

Language	Application
HPGL	Direct from software or Ioline FlexPlot.
DM/PL	Direct from software or Ioline FlexPlot.
DXF	Ioline FlexPlot only.
STD	Ioline FlexPlot only.
ASTM 6959	FlexPlot only.
Ioline syntax	Direct special control characters for FlexJet.

Specifications

	Metric	Empirical
Max. plotting width	1.83 m	72-in
Media width min. max.	 .91-m 1.88-m	 36-in 74-in
Marker length	548.6-m (Unattended)	600 yds (Unattended)
Floor space requirements Height Width Depth	2.4-m x .7-m 1.2-m 2.4-m .7-m	96-in x 26-in 46-in 89-in 26-in
Weight Actual Dimensional (US) Dimensional (Int'l)	 150 kg 190 kg 221 kg	 330 lbs 417 lbs 487 lbs
Paper type	Recycled to bond	
Feed roll position	Front floor loading	
Paper take-up roll position	Ergonomic waist-level off-loading from front	
Line thickness	Thin, normal or thick	
Resolution Best mode: Draft mode:	 600 dpi 300 dpi	
Ink cartridges	Off-the-shelf HP® 51645A cartridges	
PC interface	USB / Serial (RS-232)	
Protocol	HPGL / DM/PL	
Languages	DM/PL, DXF, HP-GL, HP-GL/2, MicroJet STD, ASTM	
Compatibility	Gerber® (Accumark®, MicroMark®, and Micro-dynamics®), Assyst®, AutoDesk® (AutoCAD®), Investronica®, IPS, Lectra®, Scanvec® (Optitex®), PAD®, Polygon®, Polytropon® (PolyPattern®), Veti-graph® and others	
Power requirements	85-260 VAC, 0.25 KVA, Single phase, 47-440 Hz	
Humidity	Non-condensing	
Warranty	1-year parts and labor	

How the FlexJet works

The Ioline FlexJet combines paper and ink cartridge motion to create vector outputs in a wide 72-in format. The data are sent to the FlexJet via either a standard RS-232 serial or USB cable. When a file is sent to the printer, the electronic system translates the vectors into instructions for the "X" (paper motion) and "Y" (Ink cartridge motion) motors. At the same time instructions are sent to the carriage assembly to apply ink to the paper.

Paper movement

Paper motion is accomplished by pulling paper through the machine with a traction shaft. The shaft is connected to the X-axis motor with a timing belt transmisison assembly. The drive-shaft rotates in one direction.

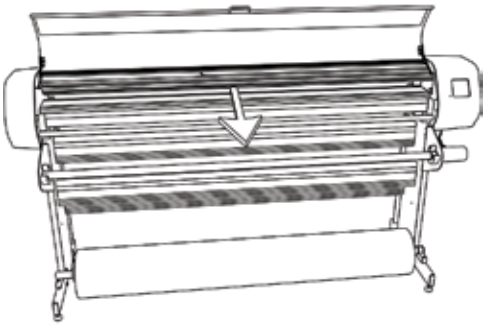


Figure 6. Paper direction.

Carriage movement

The Y-Axis transmission powers a timing belt that transports a V wheel carriage along the Y-Axis traverse extrusion. The ink cartridges are attached to the carriage and are made to apply ink to the paper by actuating the electronics of the ink cartridge. When not printing, the carriage assembly is stored in the FlexJet **Service Station** to keep the ink cartridges clean and capped so they don't dry out.

Serial number identification

Identification of Ioline Corporation products is accomplished by use of a serial number located on the back of the right side cover on the printer. You can determine the model and date of manufacture using the following guidelines:

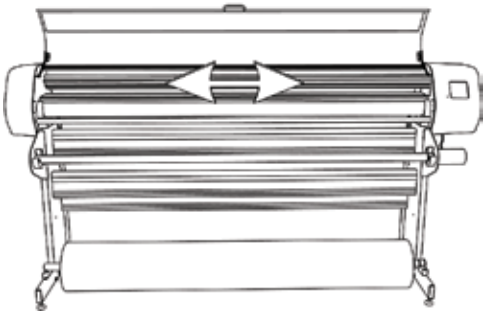
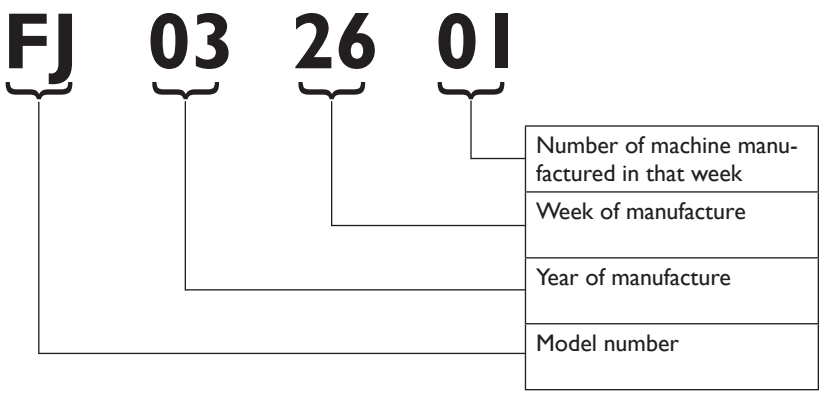


Figure 7. Carriage movement.



Glossary

BOM	Bill(s) of Material for Assembly
Bottom Pan	Metal housing protecting the underside of the printer.
Carriage	The component that holds the ink cartridges. It traveles along the Y-Axis on the traverse assembly.
Keypad	Where the user controls simple printer functions. Carriage and media motion is accessible from here during stop mode.
Traverse Assembly	The structure that supports and guides the carriage assembly.
X-Axis	The direction of the paper moving through the machine.
Y-Axis	The direction of the carriage moving back and forth.

Note

An expanded Glossary is available in the ***FlexJet User Guide***.

Software setup options

Ioline recommends using **FlexPlot** for marker making on the FlexJet. **FlexPlot** offers the most robust and flexible workflow available for creating output. It's especially useful when many file formats are used, a common situation for service bureaus. To set-up and learn how to use the software, *see the* ***FlexPlot User Guide***.

The FlexJet is designed to work in many different production environments. The type of marker printing you do will often determine your preferred communication method. Two typical methods for sending markers are:

1. **Plot directly from the marker or design software to the FlexJet.** ***(See Figure 8.)***

   Unlike other marker printers, the FlexJet is capable of operating as a stand-alone device with no extra software running on the computer. This method works if your CAD software includes a driver for any Ioline product, such as the Ioline 600Ae or the Summit 2200. It will also work if the CAD software can create a compatible HPGL- or DM/PL- formatted file.

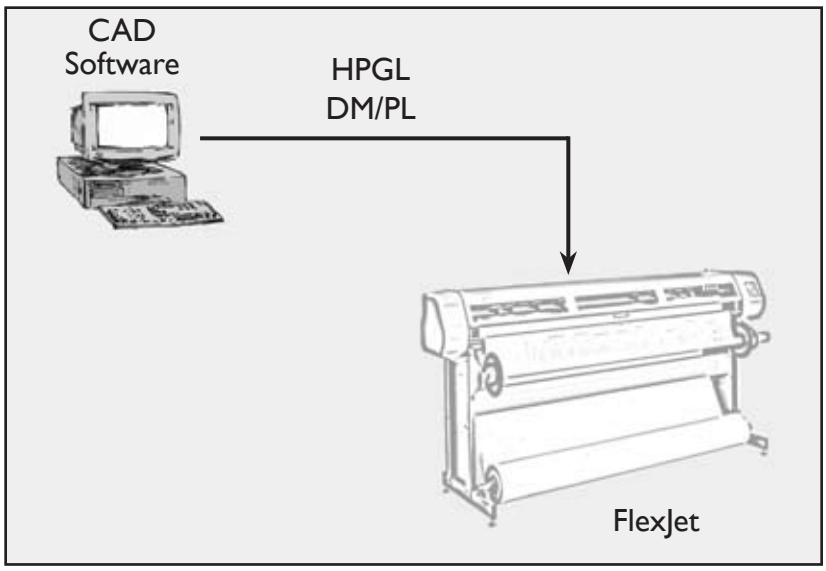


Figure 8. Workflow: output direct from CAD software (without FlexPlot).

2. Use FlexPlot software to convert files before sending them to the FlexJet for output.

The FlexJet includes the **FlexPlot** software which will convert many different files into a format that is compatible with the FlexJet. It also provides an advanced marker queue management system and other tools to optimize the performance of the printer.

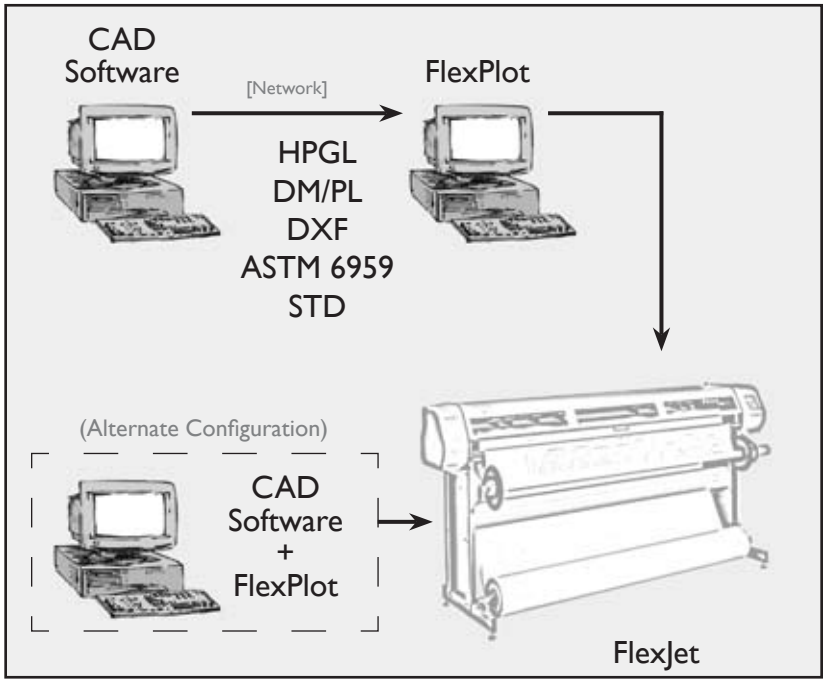


Figure 9. Workflow using **FlexPlot** for file conversion and output.

CAUTION

Keep hands and loose clothing away from all moving parts of the printer. Make sure the **Service Station** opening in the right end plate is not obstructed and that the stall latches are lowered.

Power on

Turn on the computer and the printer to make sure they both work. The printer power switch is located next to the power cord on the back of the machine, behind the keypad. When the FlexJet is powered up, the carriage will move toward the left side of the machine, then return to the opposite side to park in the **Service Station**. The **OK** light will turn red and the **Square** light will turn green on the front panel after the start-up process has finished.

Installing FlexPlot and the Control Center

The FlexJet includes two software interfaces: **FlexPlot** and the **Control Center**. **FlexPlot** will import and queue marker files from many design programs to optimize production operations. The **Control Center** is an interface for adjusting parameters to optimize printer performance. The printer comes with a CD-ROM which has Microsoft Windows® 98/2000/XP versions of the programs as well as PDF user guides and the required Adobe® Acrobat® reader.

1. Power on the computer and Windows®.
2. Insert the Ioline CD-ROM into the CD-ROM drive (usually D:).
3. The installation program should start automatically. If it does not:
   a. Select the **Start** button.
   b. Choose ***Run***.
   c. Type ***D:\IOSETUP*** (substitute the correct letter if the CD-ROM drive letter is not ***D:***) and Click **OK**.
4. Follow the instructions that appear on the screen.
5. The ***FlexPlot User Guide*** has details on using the **FlexPlot** software. In this manual, see the section ***The FlexJet Control Center*** for more details about the **Control Center** software.

The FlexJet Control Center

Overview

The FlexJet **Control Center** is a utility program that does two things:

- Allows you to adjust settings to tailor output (e.g. scale, line width) from the computer.
- Provides an interface to send completed files to the printer.

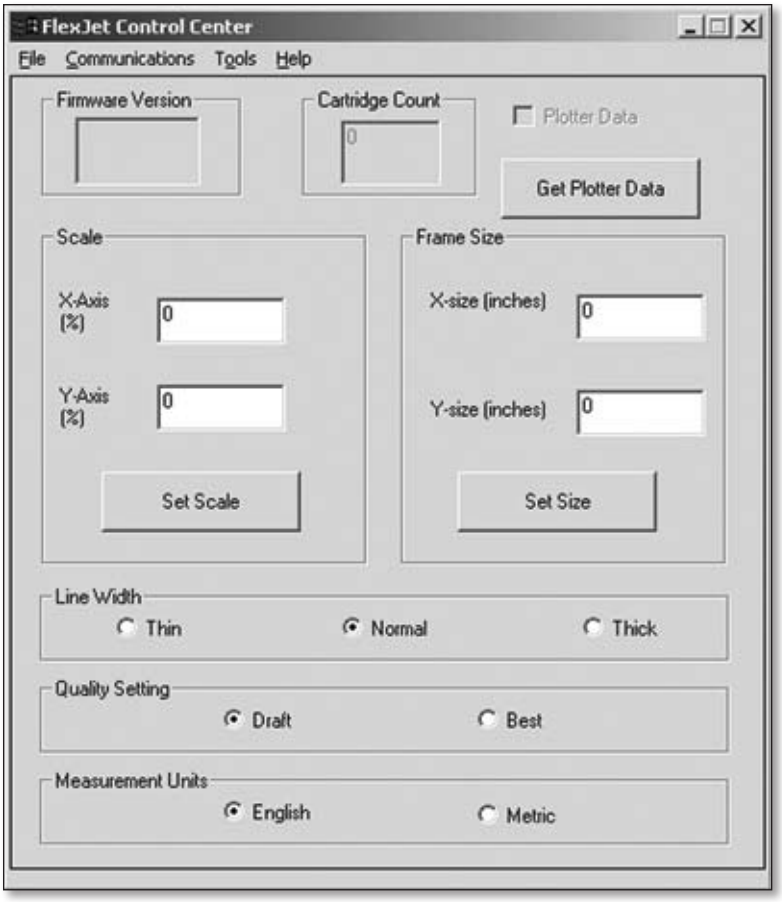


Figure 10. FlexJet **Control Center main menu.**

Changing system settings

A variety of settings are adjustable to fit specific needs:

- Make sure the printer power is on and that the initialization process is complete. The carriage will park, the keypad **OK** light will turn red and the **Square** light will turn green.
- The **Screen Menu** displays the primary settings that are adjustable. The **Menu Bar** contains utilities for setting up the **Control Center** and calibrating the FlexJet.
- Changes only take effect after one of the **Send** buttons is pushed.

Note

To avoid communication port conflicts, do not simultaneously run more than one application that communicates with the printer.

Control Center menu bar features

File

Download Firmware	Allows the user to download the latest firmware version for the FlexJet. *See the **FlexJet User Guide** for more information.*
Send Plot File	Print a PLT or PLX file.
Exit	Exit the **Control Center**.

Communications

Settings	Select the COM port and baud rate to match the printer.
Send Command	Permits advanced users to manually enter commands.

Tools

Cartridge Calibration	Displays tools to adjust print cartridge alignment. *See the **FlexJet User Guide** for more details.*
Reset Machine ID	Resets the machine serial number. A unique key code, only available from Ioline customer service, is required. It is usually only necessary if the main logic board is changed.
Size Calibration	Allows adjustment of the size calibration settings. *See the **FlexJet User Guide** for more details.*
Set Machine ID	Stores the printer serial number in permanent memory. This step is required for upgrading the number of active print cartridges in machines pre-wired for expansion.
Set Key Code	Sets the license key code to enable inactive print heads in machines pre-wired for expansion. It requires that the serial number is stored in permanent memory with the Set Machine ID function described above.

Help

About	Displays **Control Center** version information.

Control Center menu options

Software Version

Displays the current firmware version installed in the FlexJet.

Cartridge Count

Displays how many cartridges are in active use by the printer.

Get Plotter Data

Reads and displays the current settings stored in the FlexJet in the input boxes.

Plotter Data (check box)

Indicates when the displayed settings were successfully downloaded from the printer. If this box is unchecked, the **Control Center** was unable to connect with the FlexJet and cannot display current settings. Check the connections, baud rate and COM port. Press the **Get Plotter Data** button to attempt to download settings if the process failed during startup.

Line Width

Controls the weight of the plotted line using line width. Three levels are available; **Thin**, **Normal**, and **Thick**. Thin lines use less ink and make fine details like Asian text and small pieces easier to see. Thick lines use more ink to produce higher contrast lines.

Used in conjunction with the **Quality Setting** (*see below*), the FlexJet provides six options for output quality, to enable you to produce clearly visible lines using the least possible amount of ink.

Scale

The printer scale ranges from 1% to 999%. The factory default **Scale** is 100%. A scale set to 50% prints at half size. Changes do not take effect until the **Set Scale** button is pressed. Note: Both X- and Y-Axes are set independently.

Frame Size

Most design software sends long plots to printers by breaking them into smaller pieces called *frames*. In general, design software does this automatically and adjusts the **Frame Size** in the printer to match. The **Frame Size** setting establishes clipping limits for each data frame. If the printed size of a plot frame exceeds the frame size set in the FlexJet, the excess is clipped or thrown away. (If the plot is clipped, try increasing the **Frame Size** manually.) The factory-set X-axis (paper direction) frame size is 46-in (116.8-cm), maximum is 21600-in (54,864-cm). Default and maximum Y-axis (carriage direction) frame size is 72-in (182.9-cm).

Quality Setting

Choose **Draft** or **Best** to control line density. **Draft** mode uses 300 DPI. **Best** mode uses 600 DPI. A lower DPI setting uses less ink by creating a fainter line. Higher DPI uses more ink but makes a darker line. Use this setting in conjunction with the **Line Width** (*see above*) to find a balance between saving ink and making clearly visible lines.

Measurement Units

Choose between English or Metric units for settings display.

Chapter 2

Nomenclature

Product components

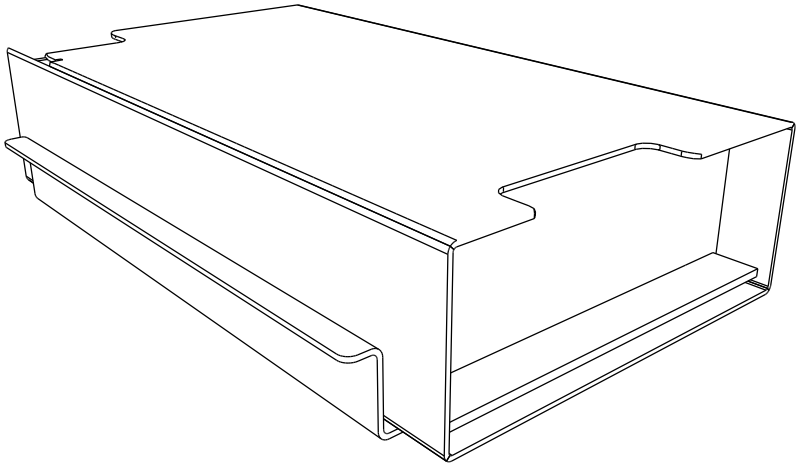


Figure 11. The Ioline Flexjet power supply.

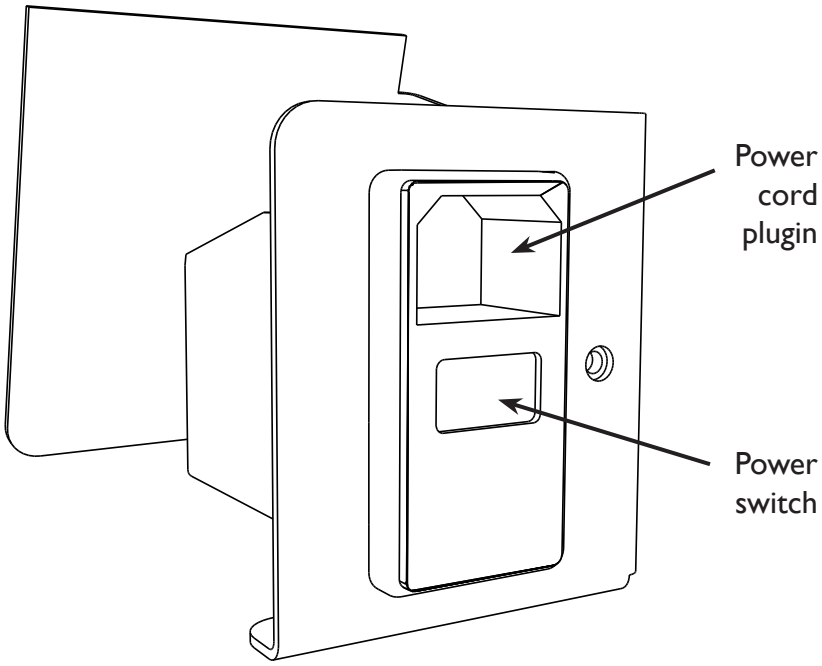


Figure 12. Rear power panel assembly.

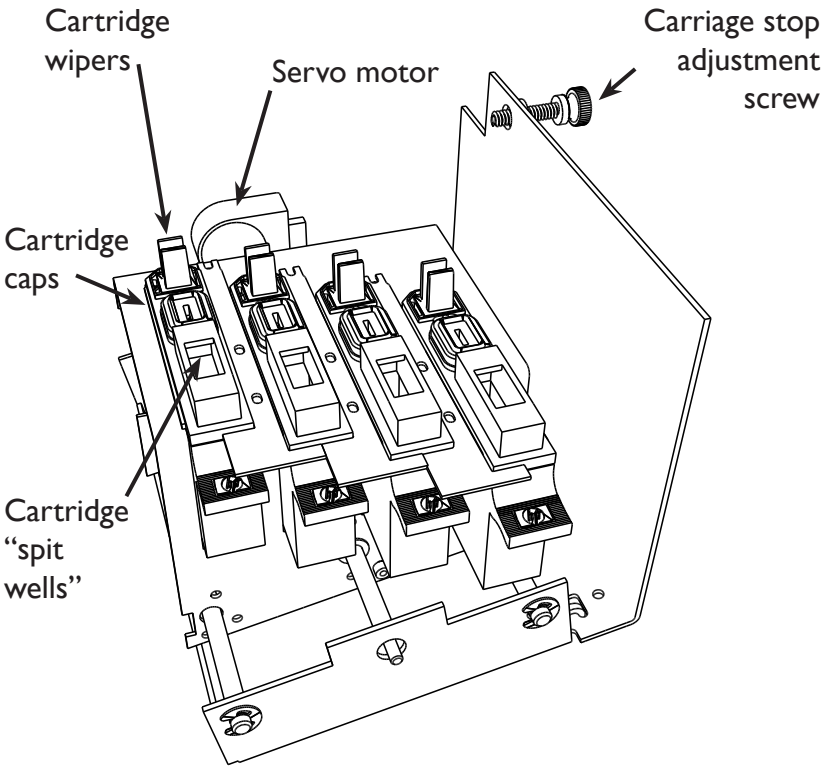


Figure 13. Service Station assembly.

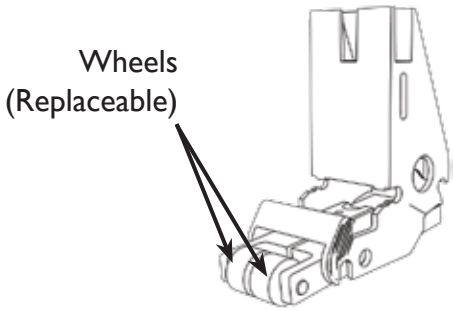


Figure 14. Pinchwheel assembly.

Figure 15. Ink cartridges: HP 51645A.

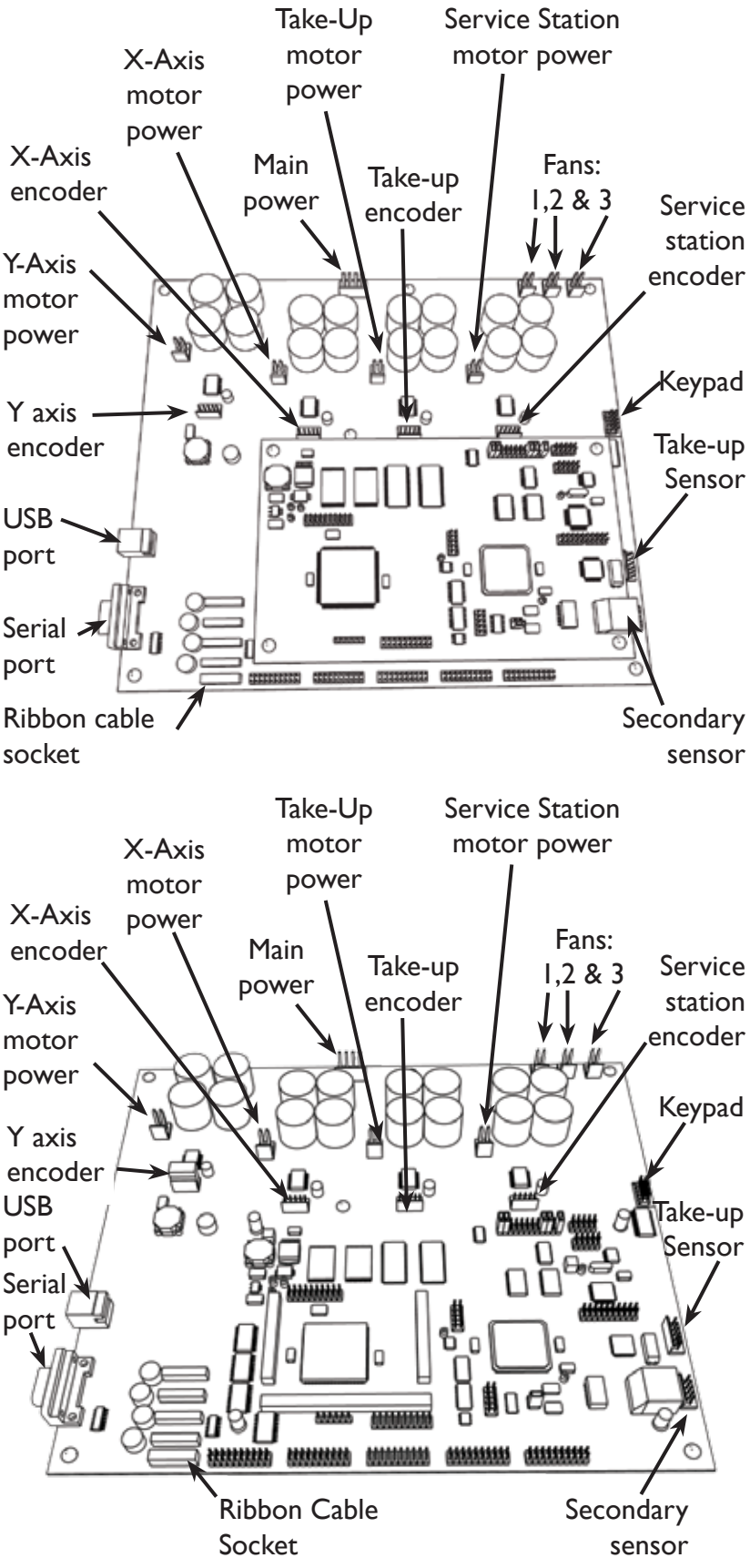


Figure 16. FlexJet logic board (Rev 1, above; Rev 2 below).

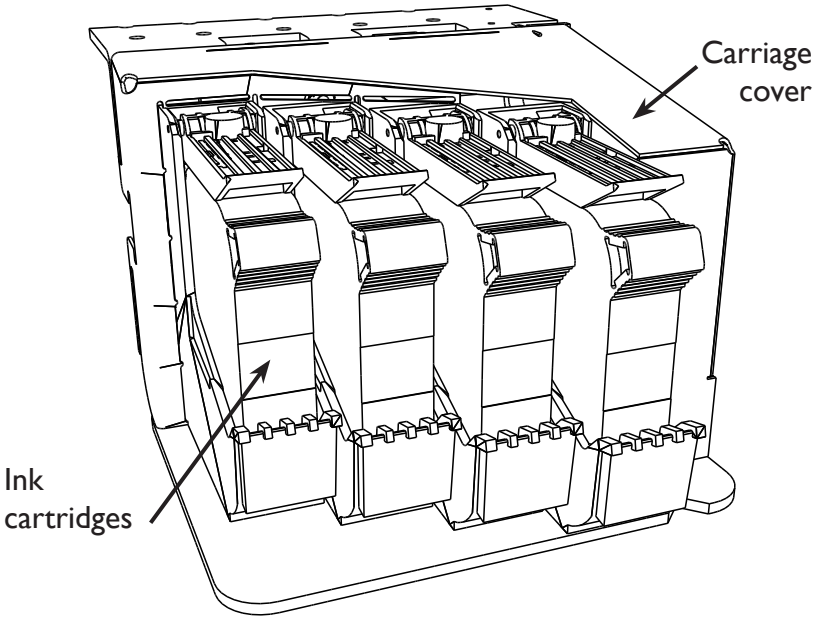


Figure 17. Carriage assembly with cover on.

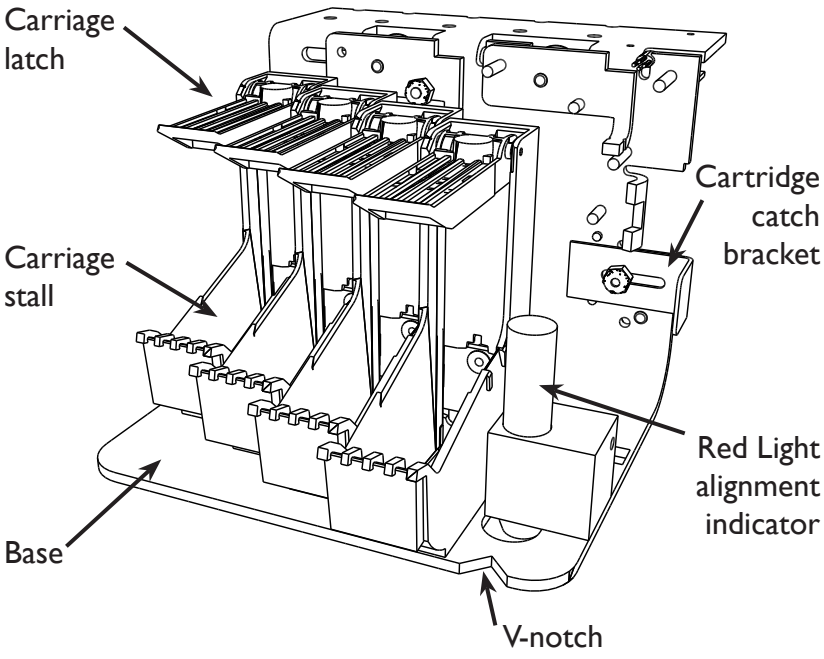


Figure 18. Carriage assembly with cover off.

Chapter 3

Troubleshooting & Testing

General troubleshooting

This section contains guidelines and testing procedures for resolving basic operatioinal difficulties and diagnosing mechanical, electrical and electronic processes. ***Chapter 4*** also contains related repair procedures.

If the system isn't functioning correctly, first determine which component is causing the problem. Likely difficulties may involve:

- **The computer**
- **The power cord or communication cables**
- **The apparel/marker design software**
- **The FlexJet printer**

Changes to the computer operating system or the installation of new peripherals or software can cause conflicts. If the problem appears to be with the computer or apparel design software, consult the appropriate documentation or an Ioline dealer.

If the problem is with the FlexJet, begin by making sure power is on and that the cable between the machines and the PC is connected correctly.

The information in this chapter begins with the simplest and most common issues, and progresses to more complex and invasive troubleshooting. If you are unable to resolve a problem after consulting this manual, fill out the ***Diagnostic Record*** at the end of this chapter then contact Ioline Customer Service.

Error messages

Error messages that are specific to the Ioline FlexJet are divided into two catagories: **Control Center** software errors and LED codes. Software errors present themselves on the computer screen and usually indicate a communication problem. LED codes are visible on the keypad and can be a green light, a red light or a combination of both.

The keypad LED code table (**Figure 19**) is helpful for isolating the cause of obvious external or communication problems. Comprehensive information later in the chapter can help troubleshoot mechanical and electrical difficulties. Errors caused by the operating system or the plotting software should be resolved with the software author.

Control Center software errors

The FlexJet did not respond. Do you wish to continue anyway?

The **Control Center** did not get a response from a FlexJet on the COM port it is currently configured to use. If the FlexJet is connected and the power is on, click '*Yes*'. Follow the directions in the ***FlexJet User Guide*** for configuring the COM port and baud rate.

Unable to open communication port. You may need to select a different COM port. Do you wish to continue?

The **Control Center** did not get a response from a FlexJet on the COM port it is currently configured to use. If the FlexJet is connected and the power is on, click '*Yes*'. Follow the directions in the ***FlexJet User Guide*** for configuring the COM port and baud rate.

Incorrect plotter model. Do you wish to continue?

The **Control Center** did not recognize the printer model connected to the COM port. Upgrade the **Control Center** to the latest version. If that does not resolve the problem, confirm that '*FlexJet Control Center*' is displayed in the menu bar of the program. If it is not, obtain the correct version from Ioline.

Fatal Error: COM port pointer is NULL Unable to recover.

A serious internal failure in the program or Windows® has occurred. Close all programs, restart Windows® then start the **Control Center** program.

Unable to change FlexJet baud rate Do you wish to change baud rate in Control Center?

The **Control Center** did not get a response from a FlexJet on the COM port it is currently configured to use. If the FlexJet is connected and the power is on, click '*Yes*'. Follow the directions in the ***FlexJet User Guide*** for configuring the COM port and baud rate.

Warning: Unable to open log file; Status messages will not be saved.

This error occurrs if the **Control Center** is unable to write the firmware upgrade process log in the same folder where the firmware source file is stored on the PC. It is typical if installing firmware from a CD-ROM or if the user does not have '*Modify*' or '*Full*' permissions to the PC file system. Copy the firmware to the hard disk and make sure permissions are correct before installing.

NOTICE: Your firmware is out of date. It is recommended that you update it as soon as possible, but it is not required. This program will work with new and old firmware. Firmware upgrades are available from Ioline Customer Service at (425) 398-8282 PST-USA.

The firmware in the FlexJet is obsolete. An upgrade is highly recommended. Contact Ioline Customer Service to obtain the software and instructions.

FlexJet is not responding. Please check your cables and baud rate.

The **Control Center** did not get a response from a FlexJet on the COM port it is currently configured to use. If the FlexJet is connected and the power is on, click 'Yes'. Follow the directions in the ***FlexJet User Guide*** for configuring the COM port and baud rate.

The identification numbers for this board have already been set. You must use the '*Reset Machine ID*' dialog to change them now.

The user is attempting to overwrite an internal license that is already set. Contact Ioline customer service for assistance.

Keypad error codes

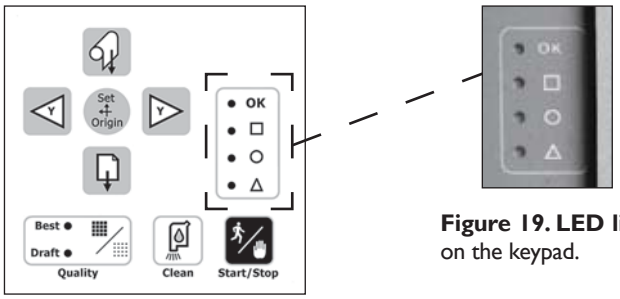


Figure 19. LED lights on the keypad.

Legend

G = Green light
R = Red light
Y = Yellow light
Y-Blink = Blinking yellow light*
OFF = Unlit

OK	■	●	▲	Problem/Status
G	OFF	OFF	OFF	Ready to Print, Origin Set
R	OFF	OFF	OFF	Paused / Offline, Keypad Active
R	G	OFF	OFF	Power on reset finished.
R	Y-Blink	OFF	OFF	Cover open (obsolete)
R	OFF	Y-Blink	OFF	Paper Feed Out / Jammed
Y-Blink	R	R	OFF	X- (paper) axis jam
Y-Blink	G	R	OFF	Y- (carriage) axis jam
Y-Blink	G	G	OFF	TU (take-up) jam
Y-Blink	R	G	OFF	SS (Service Station) jam
OFF	R	Y-Blink	OFF	Buffer Overflow
Y-Blink	OFF	R	OFF	Init from EPROM failed
OFF	R	R	OFF	File syntax error
Y-Blink	Y-Blink	Y-Blink	OFF	Printer ready to receive firmware
Y-Blink	OFF	OFF	OFF	Motors off / System Stop

Figure 20. Keypad LED error codes.

* First generation FlexJet keypad lights do not blink.

Note

If keypad errors are not shown on the chart to the left, update the firmware. For more information, please contact Ioline Customer Service.

Power problems

If the FlexJet won't power on or initialize—or if the fan does not spin—follow these initial diagnostic steps:

1. Check the power cord. Make sure that it is firmly plugged into the wall and into the back of the printer.
2. Check the voltage at the wall outlet and verifiy that it is within the operating limits as specified in ***Chapter 1***, ***Specifications***.

If there are no obvious power problems, proceed to the ***Mechanical, Electrical, and Electronic Diagnostics*** later in this chapter.

Communications

The FlexJet won't respond to the computer

If the FlexJet doesn't accept commands from the computer, try the following:

1. Verifiy that the communication cable is correctly connected to the printer and to the proper communications port on the computer.
2. Change the computer COM port settings to match the FlexJet's serial communications settings. (*See* ***Serial Communication****, below*.)

Serial communication

The serial port on the FlexJet has an adjustable baud rate. Available speeds are 9600, 19200, 38400, 57600, and 115200. It is critical that the FlexJet **Control Center**, **FlexPlot** or design software use the same baud rate that the FlexJet is using.

If there is ever any doubt about what baud rate the printer is using, Ioline recommends resetting it to the default of 38400. To reset the baud rate:

1. Turn off the power to the FlexJet.
2. Press and hold the **Page Advance** key (the key below **Set Origin**) while turning power on.
3. Continue holding the **Page Advance** key until the **OK** light turns red and the **Square** light turns green.

If using a terminal program like TeraTerm™ to communicate with the FlexJet, make sure to use ***8*** Data Bits, ***No Parity***, ***1*** Stop Bit, and ***Xon/Xoff*** (software) Flow Control.

Common problems

Good print quality is dependant upon several factors. The type of paper, environmental conditions, and operator habits are only a few of the variables that can affect the quality of the plot.

It is important to load paper in the FlexJet—and maintain it—according to the guidelines in the ***FlexJet User Guide***. The table below summarizes the some of the most common difficulties users encounter. The sections following the table examine each issue in greater depth.

A marker plot doesn't start at the correct point on the paper	
Cause: The origin is not set correctly.	**Solution:** Position the V-notch where the plot should start. Press the **Set Origin** key.
Poor line quality.	
Cause: 1. Ink cartridge is improperly installed. 2. Frame Gap setting is incorrect. 3. Carriage electronics or cables are damaged. 4. Ink cartridge is dry.	**Solution:** 1. Remove and reinstall ink cartridge. 2. Use the **Control Center** to adjust frame gap as shown in the ***Routine Maintenance*** chapter of the ***FlexJet User Guide***. 3. Contact Ioline customer service. 4. Clean or replace cartridge.
The printer does not complete the marker.	
Cause: 1. Outdated software. 2. The frame/panel size is mismatched between the printer and the design software.	**Solution:** 1. For updated firmware, please contact Ioline Customer Service. 2. Check the panel size in the software. It should be equal to the printer panel size.
When a marker plot file is sent, nothing happens.	
Cause: A communication problem has occurred or the printer is in **STOP** (red light) mode.	**Solution:** Make certain the communication port is connected and configured properly. Position the V-notch where the plot should start and press the **Set Origin** key to put the printer in **START** (green light) mode.

Regular or intermittent paper tearing.	
Cause:	**Solution:**
1. Front or rear dancer bar is not installed.	1. Install front or rear dancer bar.
2. Paper gets "yanked" by the machine during take up.	2. Make sure the front dancer bar is below the Take-up Sensor, then press **Set Origin**.
3. Paper buckles when plotting to floor.	3. Clear paper path. Refer to the ***FlexJet User Guide*** for proper loading procedures.
4. Paper roll damaged.	4. Inspect the feed paper roll. Dropping the paper roll on an end can wrinkle the edge which can catch the carriage and cause a tear.
5. Paper not loaded correctly.	5. Correct paper loading is vital. Follow the steps in the ***Operation*** chapter of the ***FlexJet User Guide*** to reset paper alignment. Make sure the front silver dancer bar is BELOW the front optical sensor before plotting.
6. Platen not level.	6. Make sure the distance between the print heads and platen surface is the same at the right, center and left side of the printer. Adjust the platen levelers as described in the ***FlexJet Quick Start Guide*** if necessary.
7. Outdated firmware does not advance paper at startup.	7. Use the **Control Center** to check the firmware version and ensure it is 324 or greater.
8. Pinchwheels press on a drive shaft bearing.	8. With power off, raise the pinchwheels and align them with the white driveshaft markers on the traverse.
Jagged scan alignment.	
Cause:	**Solution:**
1. Cartridge alignment is incorrect.	1. Use the **Control Center** to adjust cartridge alignment as shown later in this chapter.
2. Motion alignment is incorrect.	2. Use the Control Center to adjust motion alignment as shown later in this chapter.
3. Platen or stand is not level.	3. Follow the directions in the ***FlexJet Quick Start Guide*** to level the stand and platen.
4. Loose carriage pulley causing random/uneven gaps between scans.	4. Contact Ioline customer service.

Note

When changing paper rolls make sure you let the paper rest outside the packaging overnight first.

Poor paper tracking.	
Cause:	**Solution:**
1. Paper is improperly loaded.	1. Reload and align paper.
2. Bad paper roll or paper quality.	2. Replace the paper roll.
3. Pinchwheels not in correct location.	3. With power off, raise the pinchwheels and align them with the white driveshaft markers on the traverse.
4 Feed paper roll isn't centered on feed shaft.	4. Center the paper roll on feed shaft. Make sure screws are tight on both paper hubs.
5. Loose paper hubs.	5. Tighten screws on the paper hubs.
Rear heavy bar goes to the top or bottom of the channel and the keypad shows an error.	
Cause:	**Solution:**
1. Out of paper.	1. Change the paper roll.
2. Paper path is obstructed.	2. Make sure nothing is touching the feed roll and that the rear top bar rotates freely.
3. Dirty feed roll support blocks.	3. Clean then lubricate the feed shaft block. Use the included white lithium grease.
4. Paper is not aligned properly.	4. Load paper straight as described in the ***Operation*** chapter. of the ***FlexJet User Guide***.
5. Paper runs under rear cross-member.	5. Adjust paper to go between the front and rear cross-members.
Gap between each scan.	
Cause:	**Solution:**
1. Frame Gap setting is incorrect.	1. Use the **Control Center** to adjust frame gap as shown in the ***Routine Maintenance*** chapter of the ***FlexJet User Guide***.
2. Ink cartridge is out of ink, dirty or the print head is plugged.	2. Check ink level indicator. Replace cartridge if indicator is black. If cartridge is not empty, see ***Cartridge Maintenance and Handling*** under the ***Routine Maintenance*** chapter in the ***FlexJet User Guide***.

No power when printer is turned on; Keypad lights stay dark.	
Cause:	**Solution:**
1. The power cord is damaged or disconnected.	1. Check the power connection.
2. Check power supply voltage.	2. See ***Repair Procedures*** later in chapter 4.
3. The printer is damaged and needs professional service.	3. Contact an Ioline distributor or Ioline Customer Service.
Pauses during printing.	
Cause:	**Solution:**
1. Vector density is very high due to fine detail or the design software is not using fonts embedded in the printer.	1. Reduce vector density, use embedded printer fonts, or increase communication baud rate.
2. Communication baud rate is set very low.	2. Increase baud rate from the minimum of 9600 baud to the default of 38,400 or higher. Make sure the FlexJet and the software are set to the same baud rate.
3. Frame length is too big.	3. Reduce frame length. Set between 5-in and 35-in.

Note

The paper path and instructions for printing to the floor is illustrated in the ***FlexJet User Guide***, **Figure 25**.

Paper problems

Regular or intermittent paper tearing

Common situations that cause paper tearing while the FlexJet is operating include:

- The paper was incorrectly loaded in the machine.
- The rear, heavy dancer bar was not loaded in the FlexJet after the paper was loaded.

Figure 21 represents the proper paper path. The diagram on the left shows the paper after it is inserted properly and taped to the take-up shaft. The illustration on the right shows the result after the dancer bars are inserted.

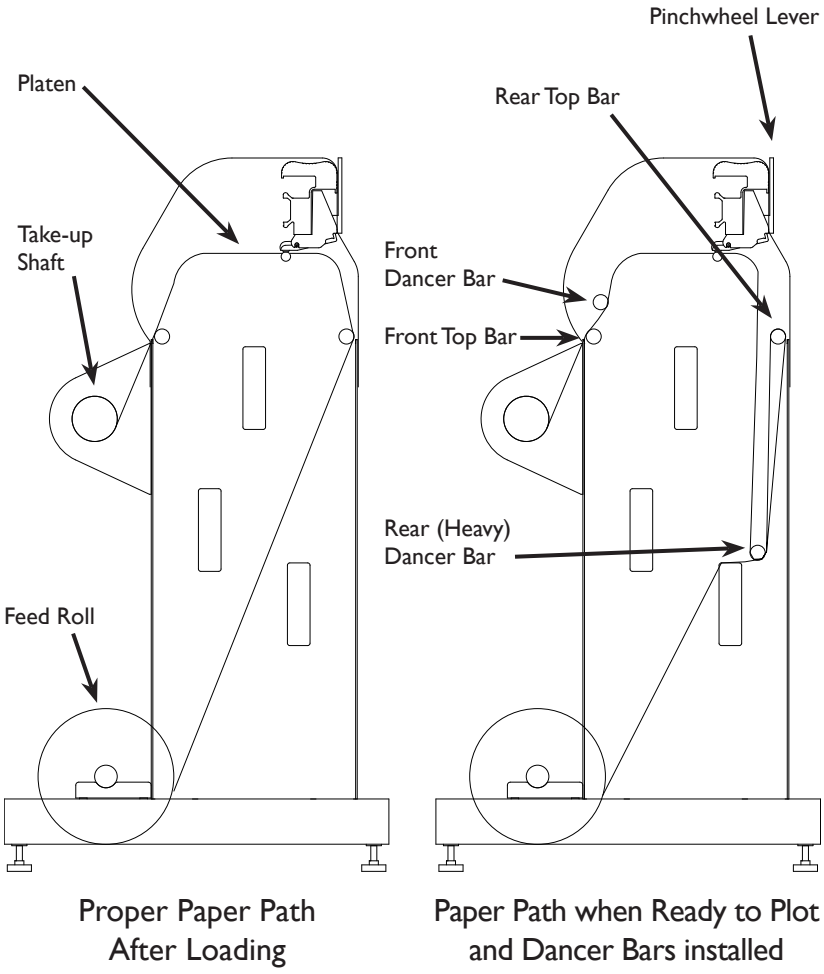


Figure 21. The correct paper feeding path on the Ioline FlexJet Printer.

Media tracking

Tracking is the process that controls media motion over the platen and assures accurate lines. If the paper slips under the pinchwheels or is out of alignment, printing quality will degrade. To resolve tracking difficulties try the following suggestions:

- Install paper correctly. *See the **Operation** chapter in the **FlexJet User Guide** for more details.*
- Make sure the paper path and dancer bars are set correctly (as shown in **Figure 21** (and in the ***FlexJet User Guide***.)
- Inspect the paper for wrinkles or folds. Never use paper that is folded, wrinkled, or torn in any way. It may cause paper jams.
- Make sure the pinchwheels are spaced across the paper as outlined in the ***FlexJet User Guide***.
- The pinchwheels should never be positioned over bearings on the drive shaft as paper tearing and bunching will occur. Verify that the pinchwheels are positioned over treads (e.g. under the white markers affixed to the traverse.)
- Check to make sure that the printer is level. *See the **FlexJet Quick Start Guide** for more information.*
- The paper may slip when debris accumulates on the drive shaft. Inspect and clean the drive shaft. Refer to the *Routine Maintenance* chapter in the ***FlexJet User Guide*** for more information.
- Contact an Ioline distributor or Ioline Customer Service if you are unable to resolve the problem or if the FlexJet is damaged.

Print quality problems

Line quality

In most cases, poor line quality is caused by one of several things:

- The ink cartridge is empty, dirty, damaged or dried up.
- The Motion Factor or Carriage Calibration needs adjustment.
- The platen is not level

If line quality is uneven, try the following:

1. Press **Start/Stop** then the **Clean** keys on the keypad to automatically clean the cartridges.
2. Inspect the ink level window on cartridge. If it is black, then the cartridge is empty. Replace it with a new one.
3. Remove the cartridge(s) and manually clean the print head with a (deionized) water-moistened, lint-free cloth. (See ***Cartridge Maintenance and Handling*** in the ***FlexJet User Guide***.)
4. Plot on higher quality or undamaged (free of wrinkles and bubbles) paper.
5. Use genuine HP 45 cartridges as recommended by Ioline.
6. Recalibrate cartridges as described below.
7. Level the platen as outlined in the ***FlexJet Quick Start Guide***.
8. Contact an Ioline distributor or Ioline Customer Service if you need further help.

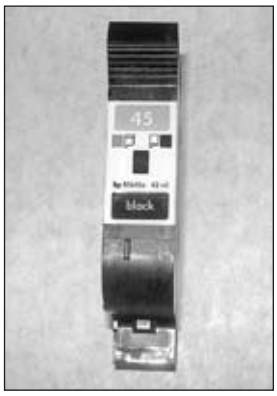


Figure 22. HP cartridges have an ink level indicator.

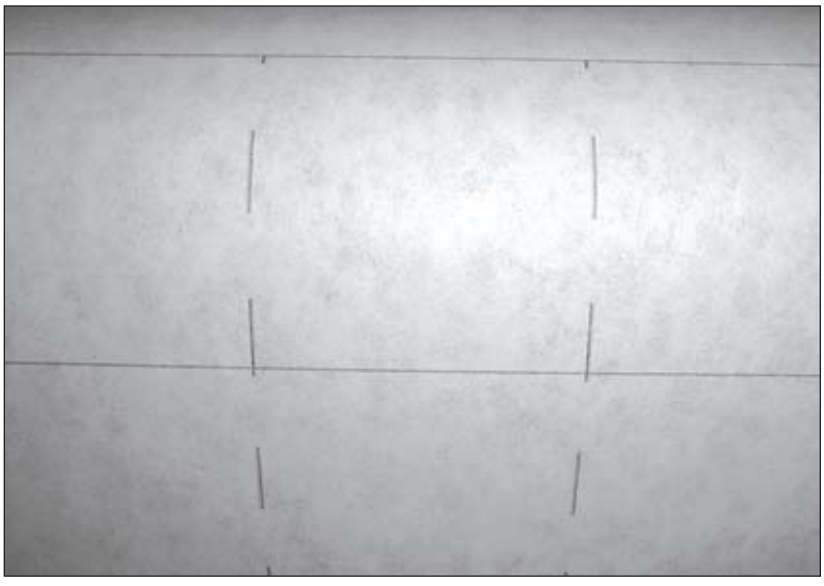


Figure 23. The ink cartridge is dirty, dry, or empty.

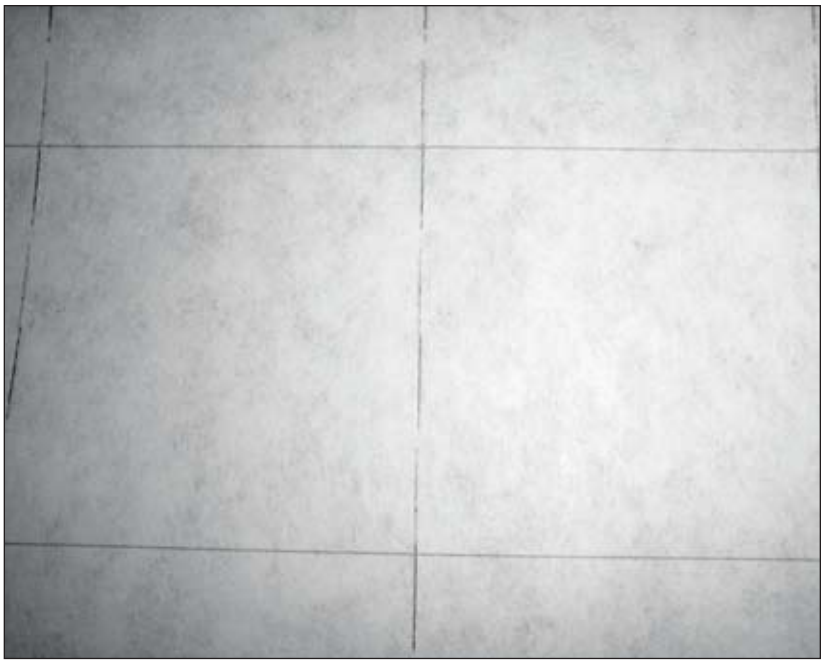


Figure 24. The ink cartridge requires cleaning.

Dirty or damaged cartridge

Sometimes a cartridge will go bad for no apparent reason. The cartridge may look perfect and be full of ink, but it will not plot. If this occurs first try pressing the Clean button on the keypad. Install a new cartridge and the tests to see if this fixes the problem.

If this has no effect remove, clean, inspect for damage, then test. If the cartridge fails again replace it.

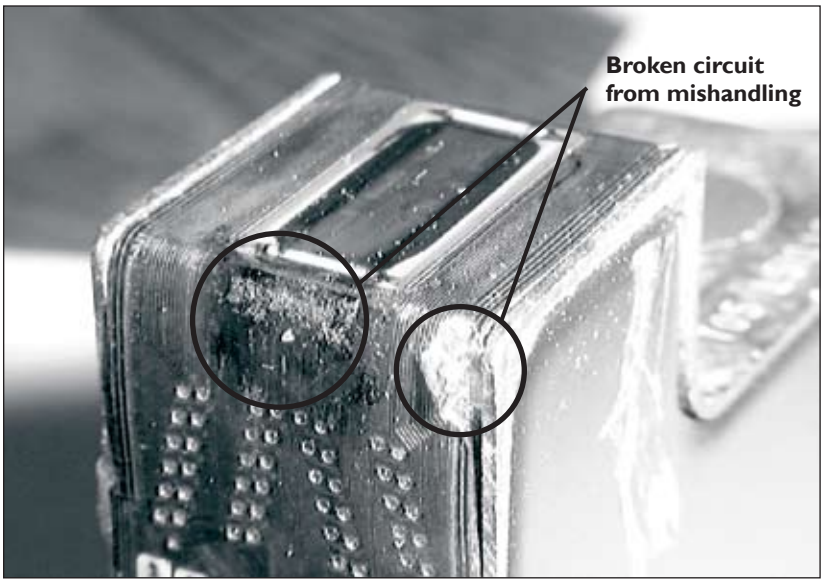


Figure 25. Damaged and dirty print cartridge.

Cartridge calibration

The **Cartridge Calibration** window is located in the **Control Center** and can be accessed in the **Tools** menu. Step-by-step instructions on the calibration process are provided in the ***FlexJet User Guide***.

The examples below show different results and settings of the cartridge calibration window. If the FlexJet is printing poorly, check some of the examples here for a possible fix.

Calibration overview

Cartridge Calibration:	Aligns the ink cartridges with each other. On 1-head machines, cartridge calibration is not neccessary.
Motion Adjustment:	Aligns (side to side) each pass of the carriage with the next pass.
Frame Gap:	Aligns (from top to bottom) each pass of the carriage.

Cartridge alignment

Cartridge alignment will align the ink cartridges with each other. This adjustment is only good for 2 or more heads. A one-head FlexJet does not need ink cartridge alignment.

Figure 26 shows a plot from a two head machine with a frame gap of -30 and all cartridges set to zero in the **Cartridge Alignment** window. As you can see, the heads don't quite line up with each other.

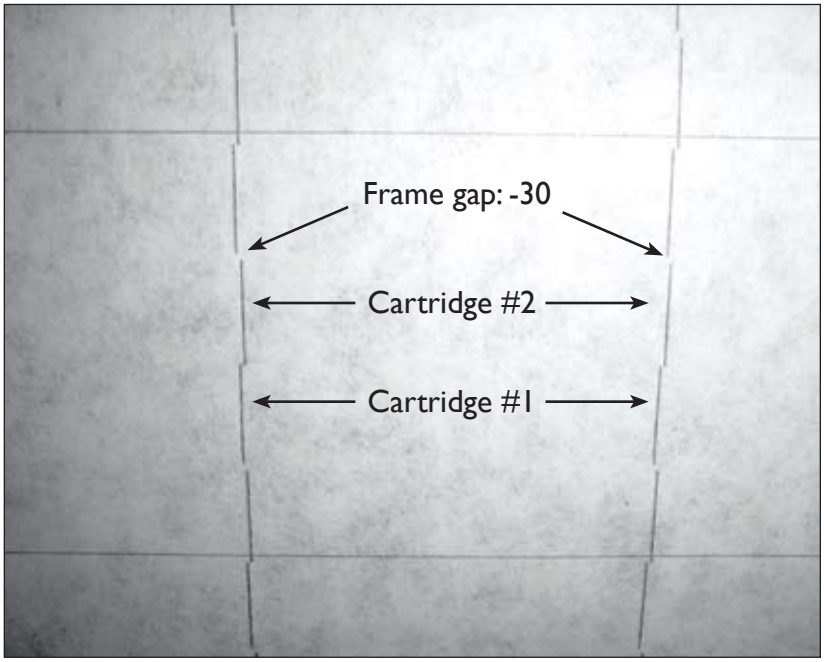


Figure 26. When calibrating, set a deliberate frame gap to help you see how the heads line up.

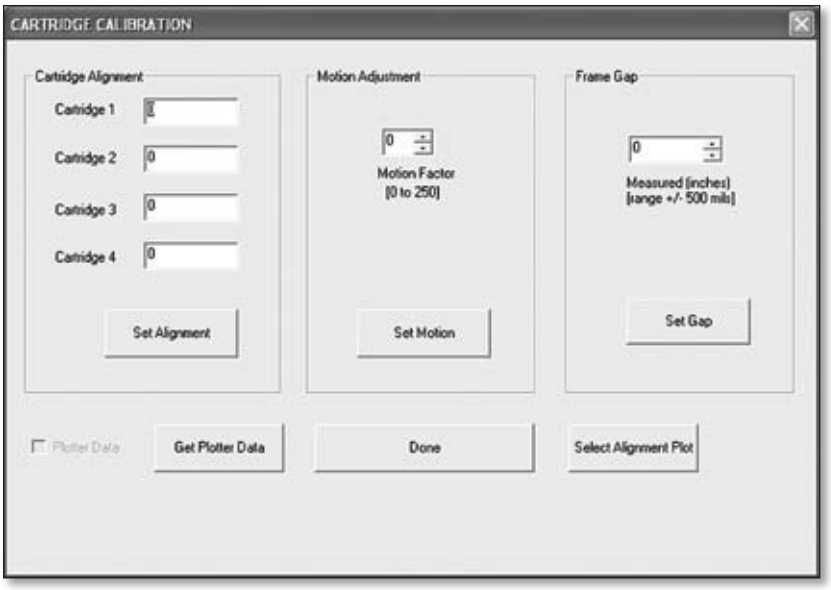


Figure 27. The **Cartridge Calibration** window in the **Control Center.**

Adjusting the cartridge alignment value

To align the cartridges on a two-head FlexJet, run the plot file ***70x8.plt*** for 72-in wide paper, or ***40x8.plt*** for 63-in wide paper.

Compare the plot to **Figures 29** & **30.** Adjust the alignment values for the second cartridge, as indicated, in the **Calibration Alignment** window to bring the two lines into alignment.

It is not necessary to adjust cartridge #1.

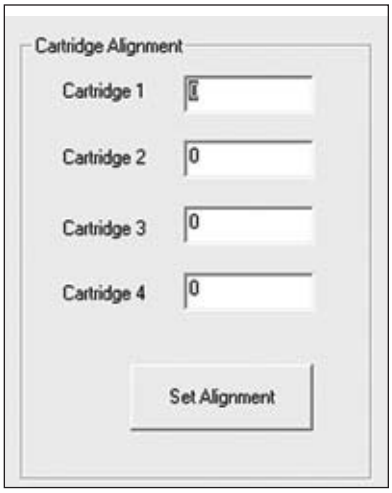


Figure 28. The Cartridge Alignment dialog box.

Note

Start with a frame gap of -30, and all cartridges set to zero so you can see a separation between the heads. This will make it easier to line the heads up with each other.

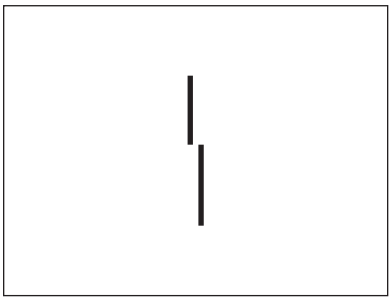


Figure 29. Increase the alignment value for cartridge #2 to improve line quality.

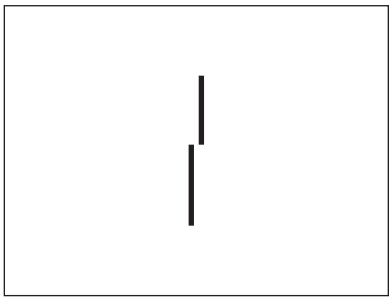


Figure 30. Decrease the alignment value for cartridge #2 to improve line quality.

Note

You must align the ink cartridges before performing motion adjustment.

Motion adjustment

To understand **Motion Adjustment**, think of each reversal in carriage direction as a "pass". With every pass, each head draws a line $^1/_2$-in long. If the FlexJet has 2 heads, it draws a 1-in line for each pass. A four-head machine will draw a 2-in line.

If the **Motion Factor** is too low, the FlexJet will draw the line too late. Visually, this appears as if the line drifts to the right, as shown in **Figure 32**. **Motion Factor** set too high results in drift to the left.

Figure 31. The Motion Adjust window.

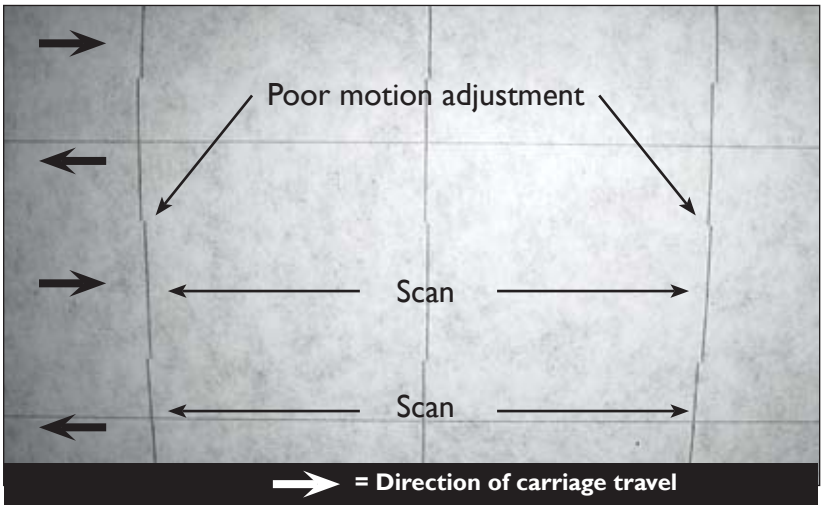


Figure 32. The heads are drawing the lines too late on this plot.

Figure 33. The Frame Gap window.

Frame gap

The frame gap is defined as the space between each pass. Use the **Frame Gap** window to make adjustments and eliminate the gap.

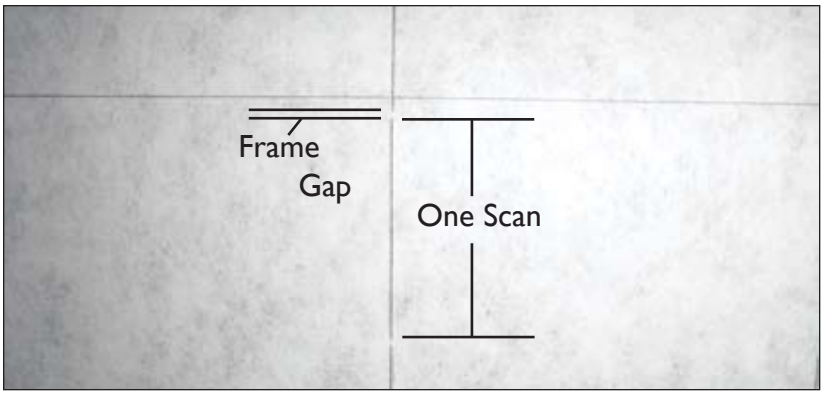


Figure 34. Frame gaps on the plot.

Unexplained frame gaps

If your plots exhibit occasional frame gaps, like **Figure 35** for instance, may indicate that the FlexJet body is not be level. Notice how the right and left lines are right on, but the middle line mis-aligned.

Figure 35. Occasional frame gaps may indicate that the FlexJet platen or stand is not level.

Try releveling the FlexJet to see if this corrects the problem. The ***FlexJet Quick Start Guide*** provides detailed instructions. You'll need to locate the height-adjusting spacer in the **Accessory Kit** for this task.

If the leveling procedure does not correct the problem, *see* ***Ink cartridge stall problems*** *later in this chapter*.

Figure 36. The height-adjusting spacer.

Ink cartridge stall problems

Always remember to close and lock the cartridge doors after removing or replacing an ink cartridge. Failure to do so can cause cracks in the bottom of the ink cartridge stall. When the carriage tries to cap in the service station, the doors hit the service station end plate. A cracked stall can cause print mis-alignment that is difficult to calibrate.

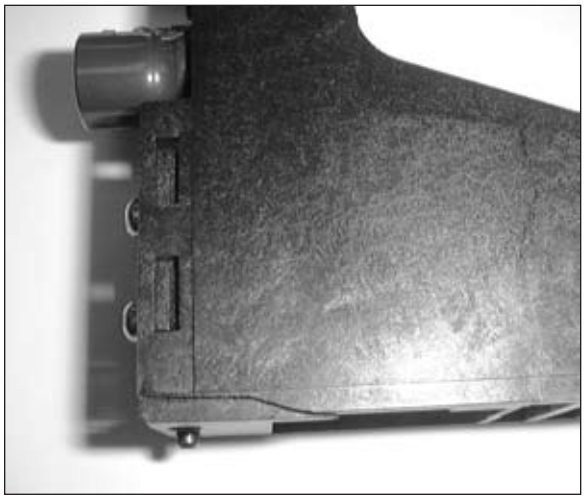


Figure 37. The ink stall can crack if the cartridge door is not closed and locked.

Noisy carriage movement

If you notice unusual noise coming from the carriage, the wheel on the carriage assembly may need cleaning or replacement. Remove the carriage assembly from the traverse and clean the wheel. Also wipe the traverse rails before re-installing the carriage assembly. If cleaning does not resolve the noise, contact Ioline Customer Service.

Figure 38. If the carriage makes noise, you may need to clean or replace the wheel.

Mechanical, electrical, and electronic diagnostics

No power to the FlexJet

If you should power the machine up and nothing happens, check the fuse in the power entry module (**Figure 39a**) on the back of the right side cover.

1. To check or replace the fuse start by flipping the fuse door down (**Figure 39b**).
2. Pull out the red fuse holder. (**Figure 39c** & **d**).
3. Check or replace fuses as needed. (**Figure 39e**).
4. Use only 5A, 250V, 5x20mm slow blow fuses for replacement.

Figure 39. Replacing the fuse.

Note

The fuse holder is universal. so it doesn't matter which way it goes back in. Make sure the flat end is facing out.

Electrical problems

If, during power on, the FlexJet experiences one or all of the following, it may have a blown transistor:

- Smoke coming from inside the machine.
- The carriage won't move.
- The carriage hits the right or left side hard.
- The carriage moves in only one direction.
- Motors only move in one direction
- A motor on the machine will try to keep turning after it stops.

The most common reason for a transistor to fail is a bad or old motor. As motors age, their bearings start to break down due to insufficient lubrication. As this break-down happens the transistors have to work harder to move the motor, causing them to heat up and eventually fail. (**Figure 40**).

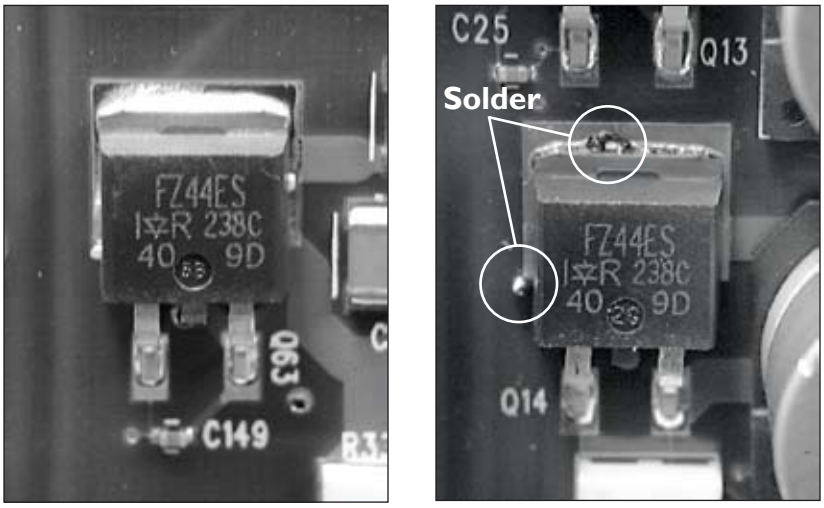


Figure 40. A good transitor on the left; the one on the right is blown. The presence of solder bubbling out of the chip indicates it overheated.

In most cases, both the transistor and motor will need replacement. Contact Ioline Tech Support for more detailed instructions on testing a transistor.

Troubleshooting sensors

The FlexJet uses the same sensor in multiple places for tracking paper path status. The sensors are industrial-grade and will withstand many years of use. If a sensor ever fails, the following conditions might occur:

1. The paper take up motor will not stop rotating and will pull the paper tight against the platen. This might result in an X motor jam and a 'popping' noise during printing.
2. The **Paper Out** sensors will not detect that the paper feed roll is empty and printing may continue with no paper in the printer.

To replace a defective sensor:

> **IMPORTANT: Never disconnect or connect sensors when power is on to the machine or electronics. This will permanently damage the sensor and might affect the logic board.**

1. Power off the printer.
2. Disconnect the plug from the sensor.
3. Note the orientation of the old sensor, specifically where the optical 'eye' is pointing.
4. Remove the old sensor by removing the hardware or adhesive.
5. Mount the new sensor in exactly the same orientation as the old one.
6. Connect the plug to the sensor, it is keyed to only connect one-way.
7. Power on and test the installation.

General mechanical / electrical issues

If you encounter any of the following problems, try the diagnostics test outlined below:

- The FlexJet didn't initialize (No LEDs, fans not running, carriage didn't move, small jerking motion during power up)
- The FlexJet has been working but did not initialize after being reset by turning the power off them back on.
- Jam messages occur without media or other objects obstructing normal operation.
- The carriage is making loud or unusual sounds.

Required tools

- Multimeter capable of reading AC voltage
- Phillips head screwdriver
- Allen wrenches: 1/16 and 5/64
- Nut driver or socket wrench with extension: 11/32

Note

This test applies to all the motors on the FlexJet.

Simple electrical diagnostics test:

1. Turn the power to the machine off.
2. Inspect the FlexJet for any obvious damage or signs of mechanical malfunction.
3. Measure the voltage at the wall socket. Verify that the AC voltage is between 85 and 250 VAC.
4. Clear all paper from the machine and make sure that nothing is obstructing movement of the front take-up roll.
5. Move the carriage from side to side by hand. If the carriage resists easy movement, the motor may be bad or there could be a short on the main board. (*See **Motor Problems** and **Testing the Logic Board** later in this chapter*.)

Motor problems

Perform the following simple test to determine if a motor problem exists. The following are possible motor problems:

1. Bad or burned motor components.
2. The motor brushes are worn down.
3. A transistor has blown on the logic board.
4. The motor is unplugged.
5. The encoder is dirty, damaged or unreadable.

Testing a motor

Test the motors on the FlexJet by following this procedure. The Y-Axis motor (**Figure 41a**, on the left side of the machine) is shown below.

1. Power the machine off and remove the left side cover.
2. Unplug the motor power wires. (**Figure 41b**).

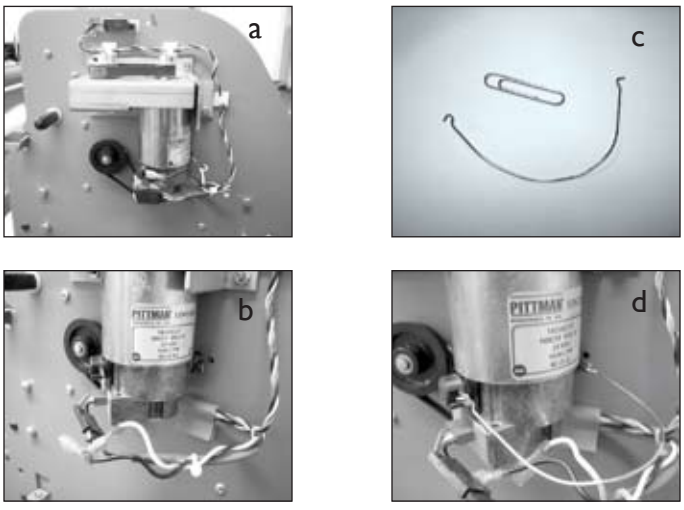


Figure 41. Testing the Y-Axis motor.

3. Straighten out a paperclip so it looks like **Figure 41c**.
4. Attach the paperclip to the power lugs as shown in **Figure 41d**.
5. Now, move the carriage back and forth by hand.
6. Now remove the paperclip and move the carriage back and forth by hand again.

This test is designed to put resistance on the motor. By connecting the two power lugs, the motor should get a lot harder to turn.

If you noticed a difference in resistance between **Steps 5** and **6**, the motor is still good. If there is no difference in resistance, most likely the motor is bad and needs to be replaced before powering the machine back on.

Logic board assembly troubleshooting

The electronic logic board is constructed of many advanced electronic components with fine pitch connections. Very few of the components are user serviceable.

The table below explains indicator lights and test points on the logic board and some troubleshooting steps to resolve user serviceable issues.

CAUTION

Ensure that the FlexJet is unplugged from the wall outlet and that all AC power cables are removed from the printer before replacing the cable.

The discharge of static electricity may damage the carriage and logic board components. Use the included ground strap throughout the procedure. Attach one end of the ground strap (included in the **Upgrade Kit**) to your wrist and the other end to a bare metal portion of the printer (like the frame the holds the service station.) Keep plastic objects away from the carriage and logic board assemblies. Remove the wrist strap only after the new carriage is attached to the traverse, the cover is installed, and the metal cover is secured over the main logic board.

Logic board troubleshooting steps (Revision 2)

LED/Test Point ID	Normal	Indicates	Error
TP6	30 VDC	30 volt main power supply is functioning	Erratic machine performance.
TP7	3.3 VDC	3.3 volt regulated power supply is functioning	Erratic machine performance.
TP8	5 VDC	5 volt regulated power supply is functioning	Erratic machine performance.
D14	Dark light	Y motor fault	Solid red
D15	Dark light	X motor fault	Solid red
D16	Dark light	Take up motor fault	Solid red
D17	Dark light	Service station motor fault	Solid red
D18	Dark light	Carriage power fault	Solid red
D20	Solid red	USB connection to PC active	Dark light
D21-D24	Blinking red pattern	Motor control system functioning	Solid lights or no lights
D25	Solid red	Serial connection to PC active	Dark light

Causes	Troubleshooting Steps
A short on the PCB. Main power supply voltage is not adjusted properly. Main power supply has failed.	DC voltage measurement between TP9 (ground) and TP6 should read 30 volts +/- 1%. If voltage is out of specification, check power supply connections and main power supply output. Contact Ioline Customer Service for more information if the voltages are out of specification.
On-board regulator failed. Main power supply failed.	DC voltage measurement between TP9 (ground) and TP7 should read 3.3 volts +/- 5%. Return logic board to Ioline for service.
On-board regulator failed. Main power supply failed.	DC voltage measurement between TP9 (ground) and TP8 should read 5 volts +/- 5%. Return logic board to Ioline for service.
Over-current condition on circuit due to a short or high heat.	Check the motor connections and motor to ensure there are no shorts to ground. A hardware problem with the motor drive circuit. Return the board to Ioline for service.
Over-current condition on circuit due to a short or high heat.	Check the motor connections and motor to ensure there are no shorts. A hardware problem has occurred with the motor drive circuit. Return the board to Ioline for service.
Over-current condition on circuit due to a short or high heat.	Check the motor connections and motor to ensure there are no shorts. A hardware problem has occurred with the motor drive circuit. Return the board to Ioline for service.
Over-current condition on circuit due to a short or high heat.	Check the motor connections and motor to ensure there are no shorts. A hardware problem has occurred with the motor drive circuit. Return the board to Ioline for service.
Over-current condition on circuit due to a short or high heat.	Check the carriage cables and the carriage logic board to ensure there are no shorts to ground. A hardware problem has occurred with the power switch for the carriage printhead power. Return the board to Ioline for service.
USB cable is not connected to a PC.	Connect to the PC USB port. The serial port does not function when the USB connection is active. Test the USB cable and connections to ensure proper working order.
Motor jam. Software error.	Remove issue causing motor jam. Cycle power on machine. Update to latest firmware.
USB cable is connected to a PC rather than a serial cable.	Disconnect the USB cable. Connect the serial cable to the PC. Test the serial cable and connections to ensure proper working order.

Service & support

Ioline has many years of experience working with designers, graders and marker makers. Feel free to contact us if you have questions—or to share information.

Getting help

Ioline is committed to providing the highest quality service and support to its customers. If you need assistance with an Ioline FlexJet, a number of resources are available:

1. First, refer to this ***FlexJet User Guide*** and ***FlexJet Quick Start Guide*** for answers to your specific questions.
2. Many detailed troubleshooting and repair issues are listed in the ***FlexJet Service Manual***, available upon request from Ioline Customer Service.
3. Consult the support section of the Ioline Web site: **www.ioline.com**. FlexJet users must have a **User Name** and **Password** to log into the site. Please contact Ioline customer service to set up your free account.
4. For additional assistance, contact your local dealer or Ioline Customer Service. Contact information is listed under ***Customer Service*** in this chapter.

Any warranty servicing of this product not specifically described in this manual must be authorized in writing by Ioline Customer Service. You may obtain service by calling or faxing Ioline Customer Service. The technicians will help you determine the nature of the problem. If factory repair is necessary, you will receive a RMA (Return Material Authorization). Please gather the information indicated on the next page before contacting Ioline or your dealer.

1. When returning a machine, carefully package the equipment in its original container or packaging equivalent. You may purchase shipping containers from Ioline by contacting Ioline Customer Service. **Ioline is not responsible for any damage due to inadequate or improper packaging.**
2. Carefully wrap and secure all items in the shipping container to prevent damage. Seal the container and note the RMA number near the address block.
3. Ship the container using FED-EX or another approved carrier. COD shipments **ARE NOT ACCEPTED**. An Ioline representative will contact you prior to the start of work with an estimate of repair cost. All repairs are warranted for 90 days.

Customer service

Ioline Corporation is committed to providing quality service and support to our customers. If you need assistance with an Ioline product, contact your local dealer or Ioline authorized service center. You may also contact:

Ioline Customer Service Department
Monday through Friday
7:00 A.M. - 5:00 P.M. U.S. Pacific Time
Voice: 1.425.398.8282
Fax: 1.425.398.8383
support@ioline.com
www.ioline.com

This page intentionally left blank.

CHAPTER 4

Repair Procedures

Maintenance procedures

See the ***FlexJet User Guide*** for information on maintaining the FlexJet and storing inkjet cartridges.

Repair procedures

The diagnostic processes that follow are detailed and invasive. Do not attempt to service the FlexJet until it you determine that simpler solutions fail to resolve the problem (*see* ***Troubleshooting***).

Follow the recommended sequence in **Figure 42** when troubleshooting repair issues with the FlexJet and record the results of your diagnostic examination on the **Diagnostic Record** (*see below*).

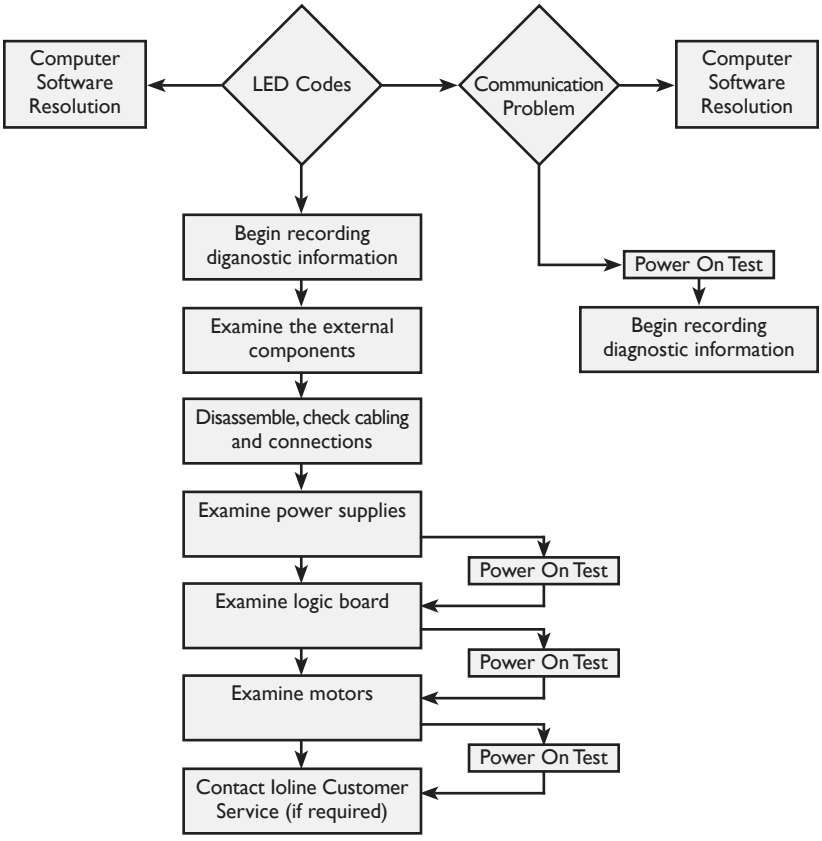


Figure 42. Mechanical, electrical and electronic diagnostics flow chart.

Requesting service

If the suggestions and guidelines in this manual don't fix the problem, fill out the form below and contact Ioline Customer Service.

Diagnostic Record

- What is the serial number for this unit? _____
- What is the logic board revision #? _____
- Name of dealer who sold the machine to you? _____
- What is the logic board revision #? _____
- Any lights on the logic board associated with this problem? **Y / N**
- Any lights on the keypad associated with this problem? **Y / N**
- Has the unit worked properly up to the point of this recent failure? **Y / N**
  If yes, please describe them: _____
- Any communications or software problems? **Y / N**
  If yes, please describe them: _____
- When the printer is first turned on—
  - Does the carriage move smoothly? **Y / N**
  - Does the fan come on? **Y / N**
- With power off, slide the carriage from side to side.
  - Does the carriage slide easily to each side? **Y / N**
  - Is there more resistance to move the carriage: **Left / Right / Equal**
- Were all cable connections securely fastened to the logic board? **Y / N**
- Was the power voltage within the tolerance? **Y / N**
- Record the power supply voltage readings here:
  TP6 (+30V) _____
  TP7 (+3.3V) _____
  TP8 (+5.0V) _____
- Were any encoders bad? If yes, which ones? **Y / N**
  X motor____ **Y motor**____ **Roll Feed motor**____
- Please list any other problems. (Be specific about the nature of the problem and the symptoms associated with it.

  _____

  _____

  _____

  _____

  _____

Carriage procedures

FlexJet carriage replacement

Required tools

- Phillips screwdriver
- $^{9}/_{64}$-in (3.5mm) Allen wrench
- $^{5}/_{16}$-in (8mm) open-end wrench
- Small, flat-tipped screwdriver

Parts/tools included with the upgrade kit:

- Replacement carriage assembly
- Tyraps (8)
- Grounding wrist strap

Step 1: Prepare the printer

1. Turn power off to the FlexJet.
2. Clear paper from around the carriage.
3. Remove inkjet cartridges. There is no need to store or cover the cartridge heads.
4. Remove the AC power cable and any other cables connected to the rear of the printer.

Step 2: Remove the end cover

1. Unplug the roll feed motor under the right end cover.
2. Remove the five screws that hold the plastic end cover on the right end of the printer. There are two screws on the flat surface of the end plate, one screw in the back, and two screws on the bottom. (**Figure 42**.)

CAUTION

Observe caution when handling electrostatic-sensitive devices.

The discharge of static electricity may damage the carriage and logic board components. Use the included ground strap during all procedures. Keep plastic objects away from the carriage and logic board assemblies.

Ensure that all AC power cables are removed from the printer before attempting these procedures.

CAUTION

The FlexJet is heavy and could cause injury if it falls. A minimum of two people are required to safely unpack the printer and attach it to the stand.

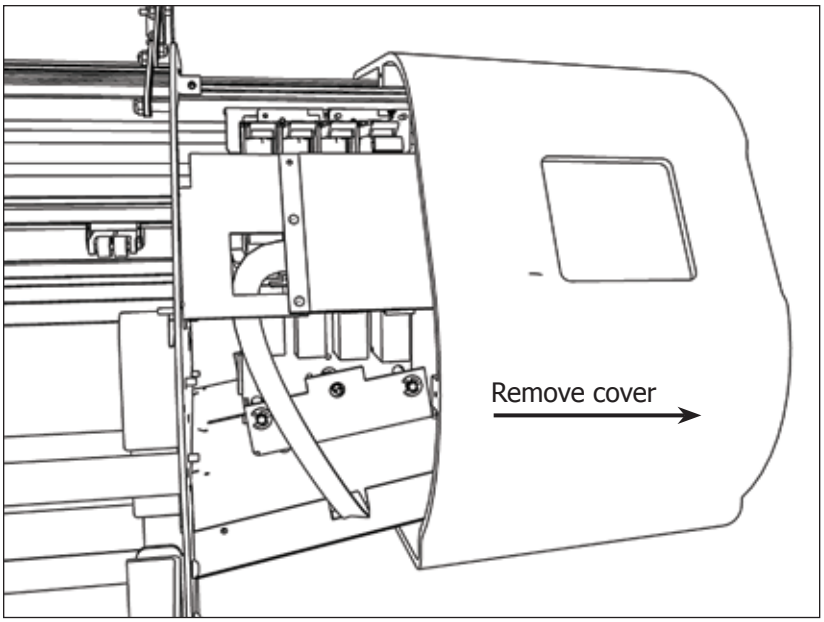


Figure 43. Removing the right end cover.

Step 3: Loosen the carriage belt

1. Find the belt tensioner on the right side above the white cables.
2. Loosen the carriage belt tensioner by rotating the $^{9}/_{64}$-in HEX screw 4 full counterclockwise turns. (**Figure 44**.)

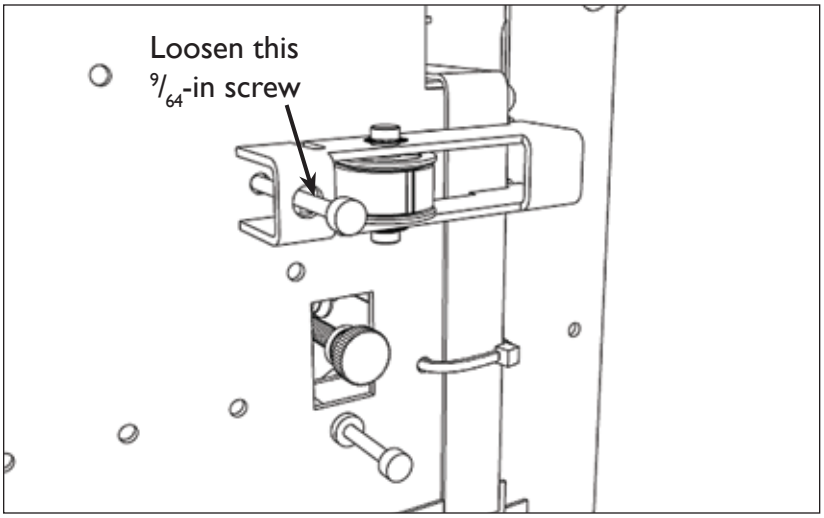


Figure 44. Loosen the belt tensioner.

Step 4: Remove the old carriage

1. Remove the Phillips head screw (on the right side of the carriage cover) that holds the carriage cover on.
2. With one hand to each side of the carriage, gently pull the carriage cover tabs out. The tabs are located near where the carriage belts attach to the carriage. Remove the carriage cover.

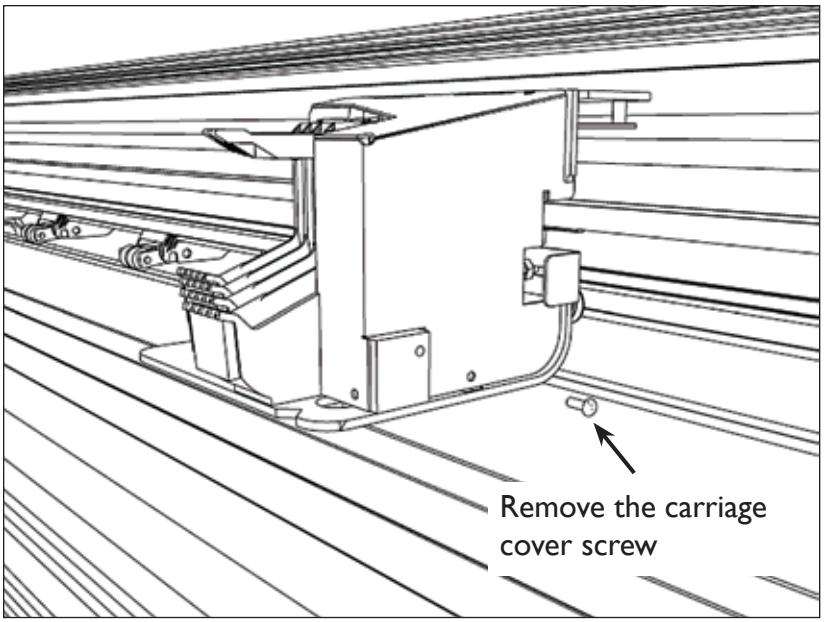


Figure 45. The carriage cover screw.

3. Unclip the carriage belt ends at the left and right sides of the carriage base. (**Figure 46**.)
4. Using a $^{5}/_{16}$-in (8-mm) open-end wrench, loosen the #6-32 hex nut one-half turn under the right and left swing arms until the washers and round spacers move freely. (**Figure 47**.)

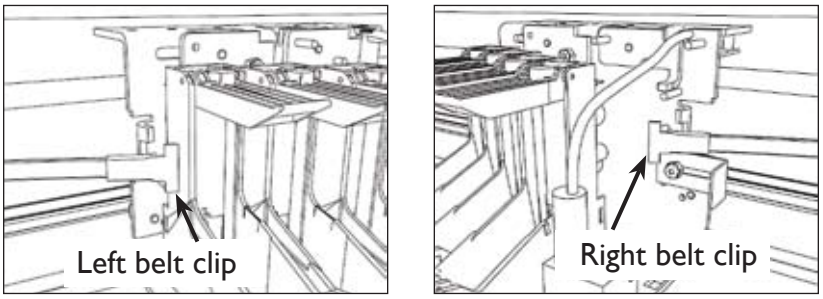


Figure 46. Unclip the belt from both ends of the carriage.

5. Hold the carriage at the right and left side of the metal base with both hands.
6. Keeping the top two carriage v-wheels on the traverse, gently push the carriage down (**Figure 48**) and rotate the bottom of the carriage towards the front of the machine until the lower v-wheels slip off of the lower traverse rail. (**Figure 49**.)
7. Lift the carriage up and away from the machine. The long flex cable bundle should follow the carriage as you pull it off.
8. Cut the tyraps and disconnect the ribbon cable ends from the back of the carriage. The cables are staggered so there is only one way they can be installed on the new carriage assembly.

CAUTION

Do not hold the carriage by the inkjet head stalls or the sensor. Improper removal or installation of the carriage can damage the carriage wheels.

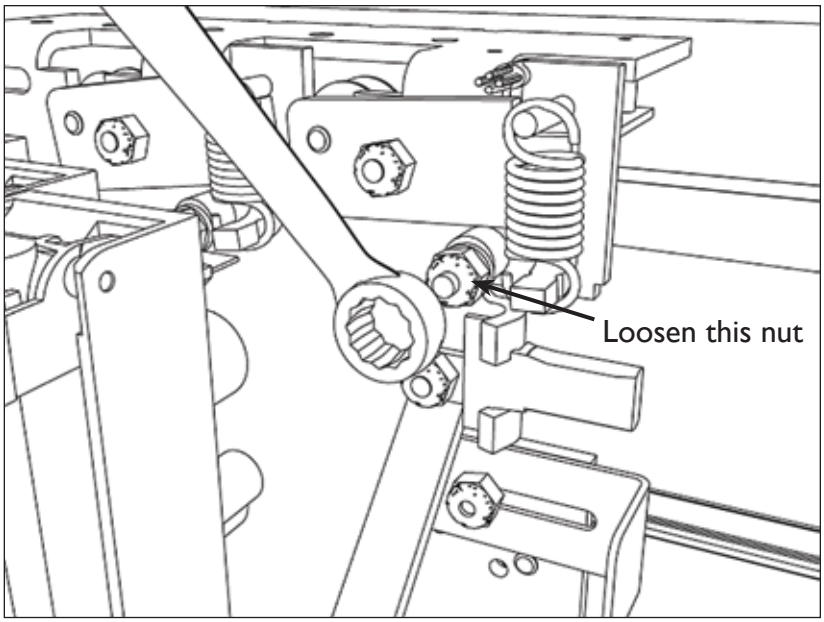


Figure 47. Loosen the carriage wheel lock.

CAUTION

Do not hold the carriage by the inkjet head stalls or the sensor. Improper removal or installation of the carriage can damage the carriage wheels.

Step 5: Install the new carriage

1. Connect the ribbon cable ends to the new carriage and secure with tyraps. Verify that each connector is plugged into all the pins and that the 2 spacers and washers are loose so that the upper wheels are not locked.
2. Ensure that the black drive belt is between the traverse rails and behind the carriage base. Hold the carriage at the right and left side of the metal base with both hands and slip the top two carriage v-wheels over the top rail of the traverse.
3. With the top two carriage v-wheels on the traverse, gently push the carriage down and rotate the bottom of the carriage towards the back of the machine until the lower v-wheels slip onto the lower traverse rail.
4. Gently move the carriage right then left to ensure that the wheels move smoothly.

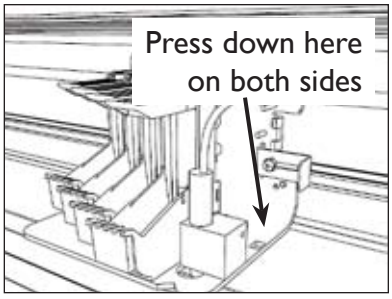


Figure 48. Gently press down on the carriage.

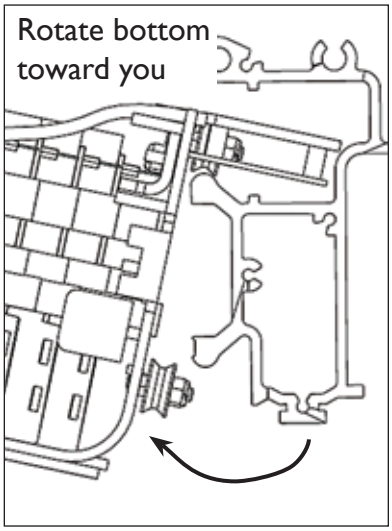


Figure 49. Rotate the v-wheels free of the traverse rail.

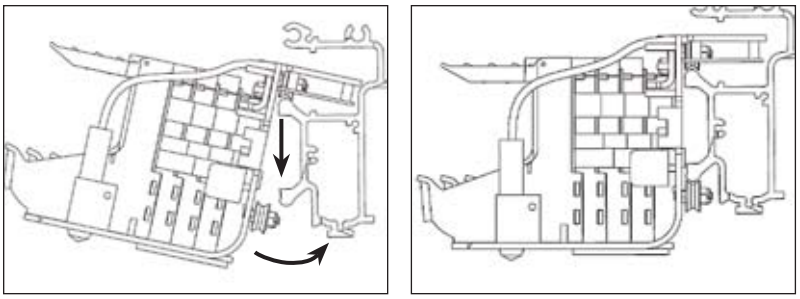


Figure 50. Carriage installation.

Step 6: Tighten the carriage swing arms

1. Gently hold the spacer up against the bottom of one of the upper v-wheel swing-arms. The spacer can be held up with a finger or a small screwdriver inserted from the right side of the carriage.
2. While keeping gentle upward pressure on the spacer, securely tighten the nylock nut using a $^{5}/_{16}$-in (or 8-mm) open-end wrench.
3. Repeat this process for the other swing arm on the carriage.

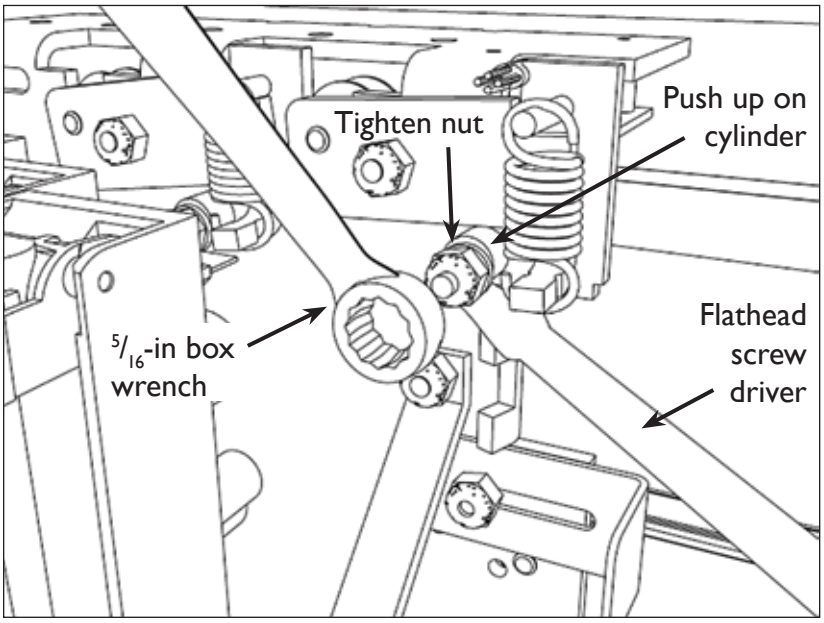


Figure 51. Use the spacer when attaching each swing arm.

Step 7: Replace tensioner and attach the carriage belt.

1. Attach the belt ends to the right and left side of the carriage.
2. Hold the carriage belt tensioner so that the two tabs and screw tip rest in the holes and detent in the right endplate. (**Figure 52**.) To the left of the **Service Station** area, hold both webs of

Note

Make sure the belt is not twisted before attaching the clips.

the carriage belt to maintain slight belt tension so that the carriage belt tensioner doesn't move out of place.

3. While maintaining tension on the carriage belt, attach the carriage belt clips to each side of the carriage base.
4. Tighten the carriage belt tensioner by rotating the $^{9}/_{64}$-in (3.5-mm) screw four full clockwise turns.

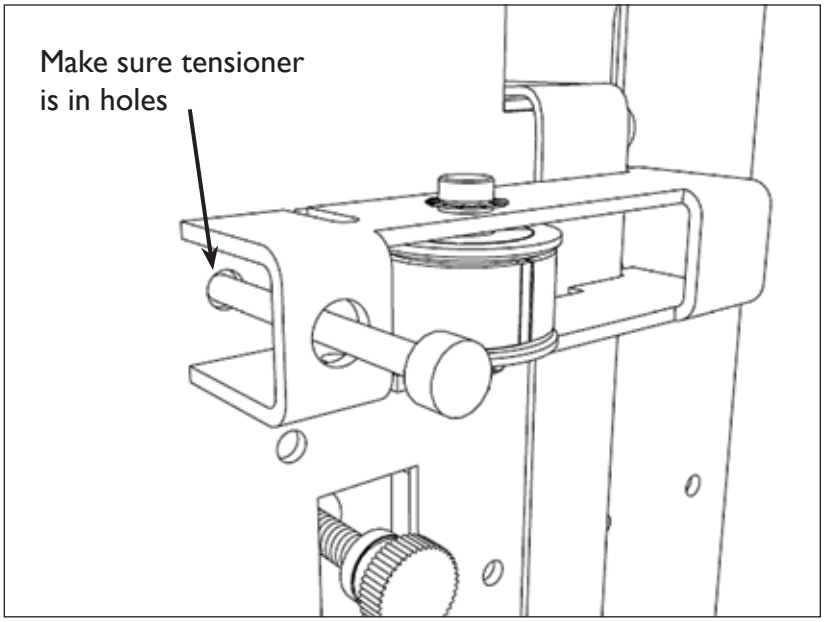


Figure 52. The carriage belt tensioner.

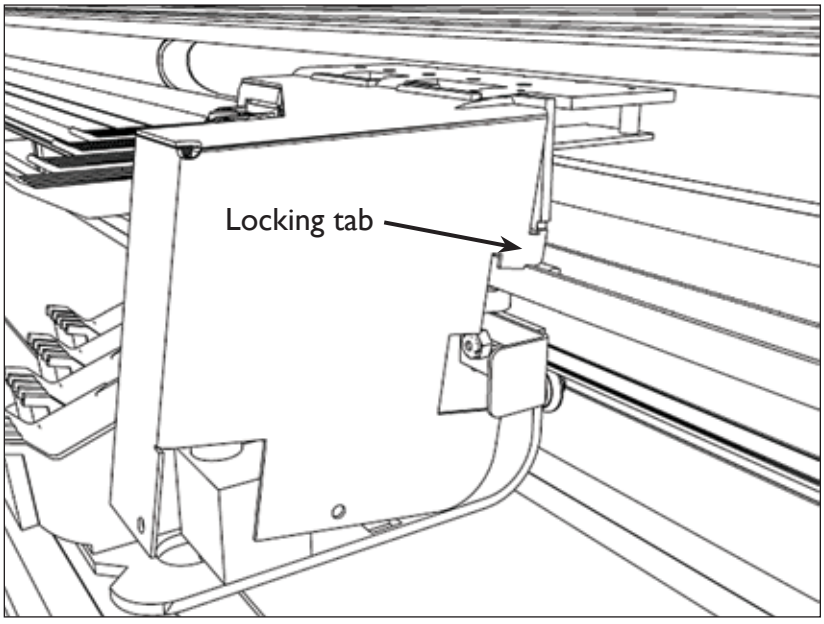


Figure 53. Install the carriage cover.

Step 8: Install the carriage cover

1. Install the carriage cover by aligning it with the base and pushing back until the tabs by the belt ends grab onto the carriage base. (**Figure 53**.)
2. Press against the cover tabs to ensure that they 'snap' into the slots in the carriage base.
3. Install the #6-32 screw at the right side of the carriage.

FlexJet Cable replacement

Tools Required

- Philips screwdriver
- $^{9}/_{64}$-in (3.5-mm) Allen wrench
- $^{5}/_{16}$-in (8-mm) open-end wrench
- Small flat-tipped screwdriver

CAUTION

Ensure that the FlexJet is unplugged from the wall outlet and that all AC power cables are removed from the printer before replacing the cable.

The discharge of static electricity may damage the carriage and logic board components. Use the included ground strap throughout the procedure. Attach one end of the ground strap (included in the **Upgrade Kit**) to your wrist and the other end to a bare metal portion of the printer (like the frame the holds the service station.) Keep plastic objects away from the carriage and logic board assemblies. Remove the wrist strap only after the new carriage is attached to the traverse, the cover is installed, and the metal cover is secured over the main logic board.

CAUTION

The FlexJet is heavy and could cause injury if it falls. A minimum of two people are required to safely unpack the printer and attach it to the stand.

Step 1: Prepare the printer

1. Turn the FlexJet power off. Remove the AC power cable and any other cables connected to the rear of the printer.
2. Clear paper from around the carriage.
3. Remove inkjet cartridges. Do **NOT** cover the cartridge heads.

Step 2: Remove the end cover

1. Unplug the roll feed motor under the right end cover.
2. Remove the five screws that hold the plastic end cover on to the right end of the printer. There are two on the flat surface of the endplate, one screw in the back, and two screws on the bottom.

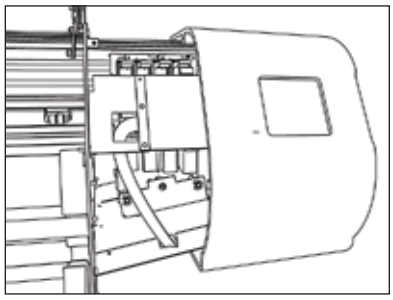


Figure 54. Remove the cover.

Step 3: Loosen the carriage belt

1. Find the belt tensioner on the right side above the white cables.
2. Loosen the carriage belt tensioner by rotating the $^{9}/_{64}$-in hex screw four full, counterclockwise turns. (**Figure 55**.)

CAUTION

The logic board cover will swing down when the last screw is removed. Make sure to support it with one hand and let it slowly rotate.

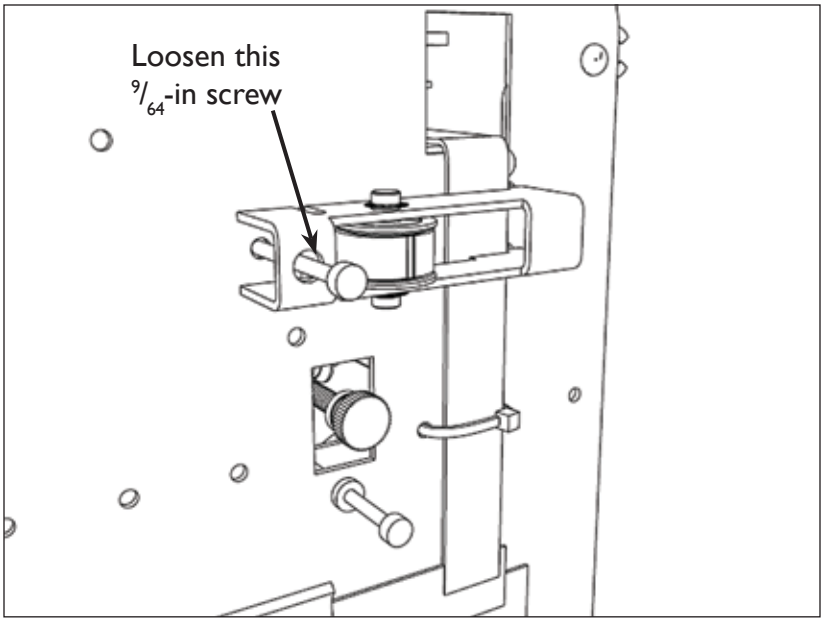


Figure 55. Install the carriage cover.

Step 4: Remove the logic board cover

1. Remove the four screws that hold the sheet metal logic board cover plate. (**Figure 56**.)
2. Put static strap on. (*See **Caution** in margin on page 69.*)

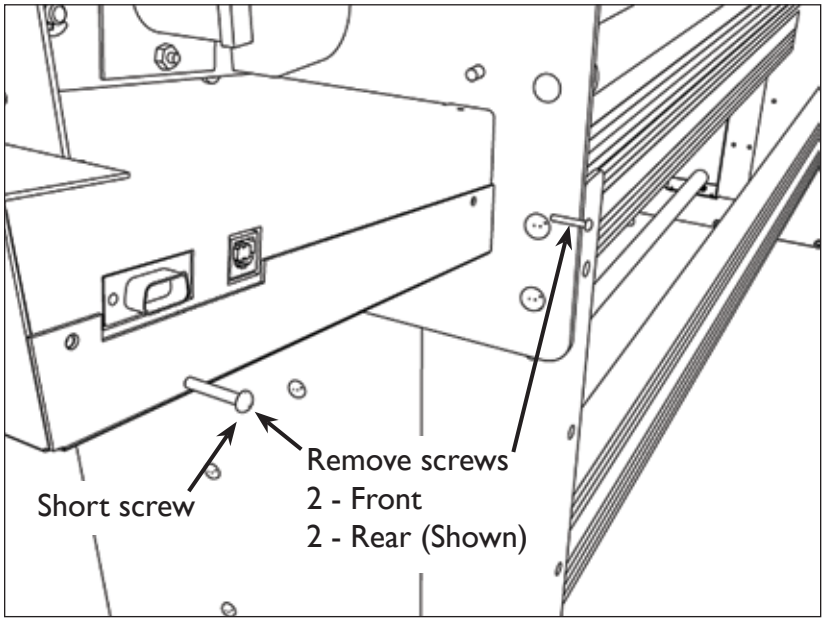


Figure 56. Remove the logic board cover plate.

3. Unplug the roll feed motor power and encoder cables from the logic board. Set the logic board cover aside. (**Figure 57.**)

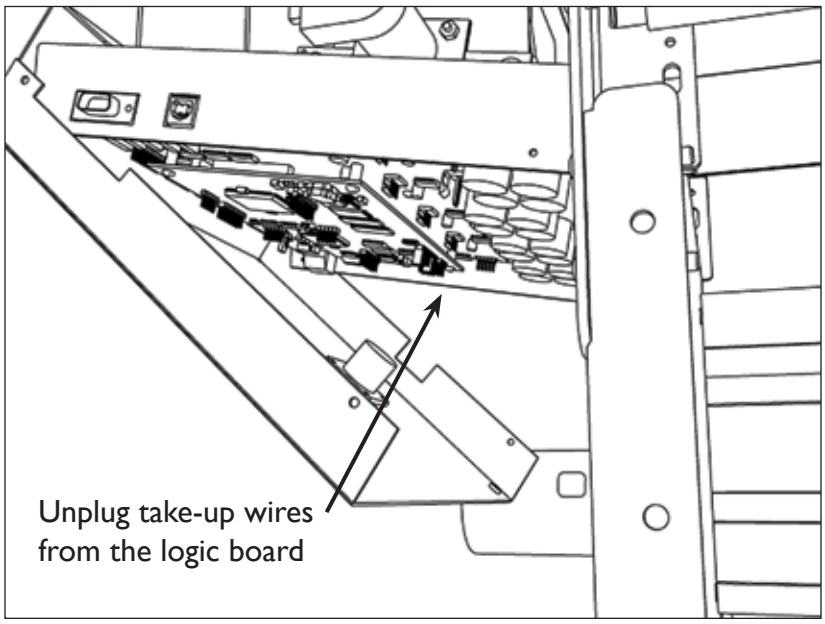


Figure 57. Unplug the feed motor and encoder cables from the logic board.

4. Find the white flex cable connections. Gently pull the locking clips on the connector shrouds down to unlock the flex cable connectors.
5. Remove all white flex cables from connectors. (**Figure 58**.)

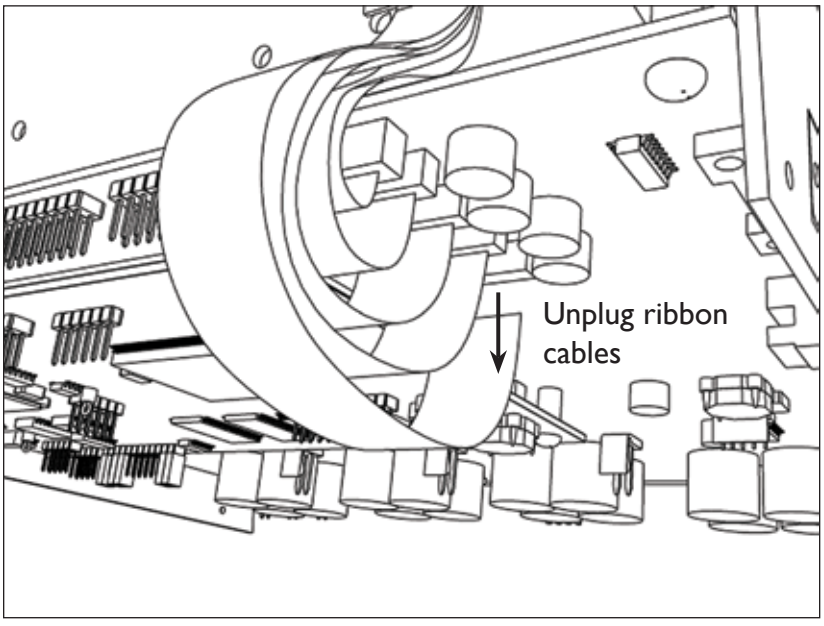


Figure 58. Unplug the ribbon cables.

Step 5: Remove the old flex cables

1. With the carriage secured, clip the plastic ties that hold the white flex cables against the right side of the printer.
2. Pull the bundle of cables out of the grey clips (if present).
3. Pull the bundle away from the end plate if it secured with foam tape. Lift the carriage belt tensioner out of the way if necessary.
4. From the front of the machine, pull the bundle through the hole in the end plate.
5. Lift the cable bundle up and off the traverse moving toward the left side of the machine. Don't worry about the foam tape stuck to the traverse.

Step 6: Attach the new carriage to the traverse

Important: Read these steps fully before attempting to attach the carriage.

1. Feed the new ribbon cable bundle into the channel in the traverse so that there is a loop to the left of the carriage. (**Figure 59**.) Lightly press the loop into the groove at the back of the traverse so that it is in the cable channel.
2. Ensure that the black drive belt is between the traverse rails and behind the carriage base. Hold the carriage at the right and left side of the metal base with both hands and slip the top two carriage v-wheels over the top rail of the traverse.
3. Keeping the top two carriage v-wheels on the traverse, gently push the carriage down and rotate the bottom of the carriage towards the back of the machine until the lower v-wheels slip onto the lower traverse rail.

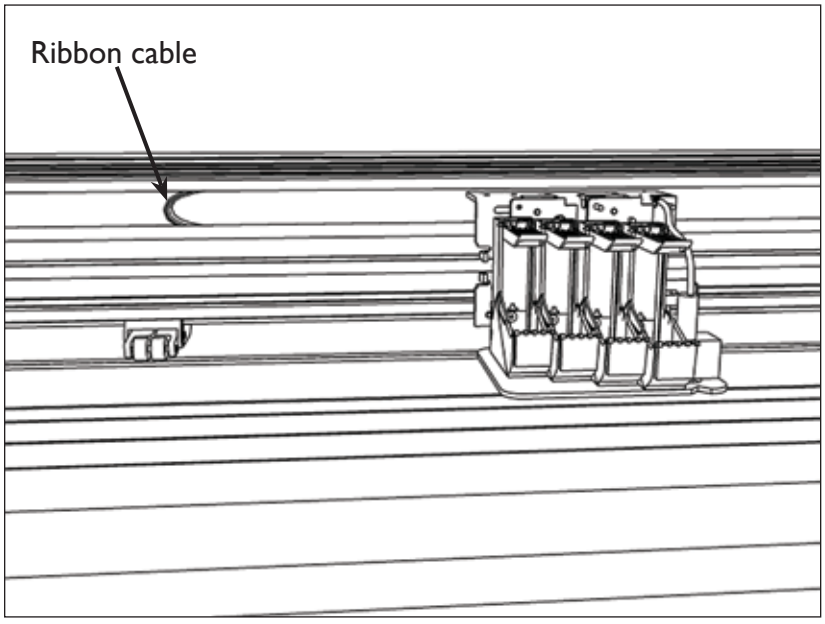


Figure 59. Make a loop in the ribbon cable to the left of the carriage.

CAUTION

Do not hold the carriage by the inkjet head stalls or the sensor.

4. Gently move the carriage right then left to ensure that the wheels move smoothly.

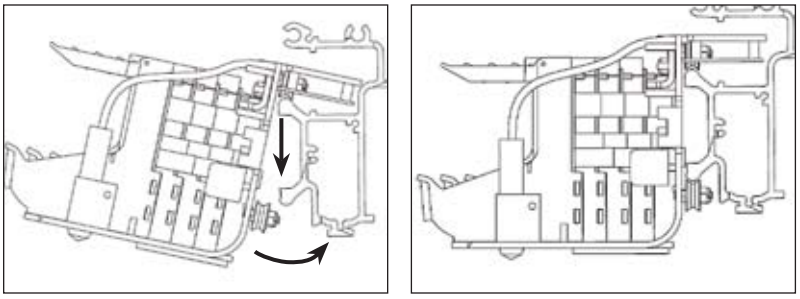


Figure 60. Carriage installation.

Step 7: Replace tensioner and attach the carriage belt.

1. Guide the ribbon cable bundle under the carriage belt tensioner.
2. Place the new belt tensioner next to the old one. Count the exposed screw threads on the old tensioner then rotate the screw in the new one to match the old one.
3. Insert the belt through the new tensioner so that the belt teeth face the pulley.
4. Guide both ends of the belt through the hole in the endplate and in front of the traverse.
5. Hold the new carriage belt tensioner so that the two tabs and screw tip rest in the holes and detent in the right endplate. (**Figure 61**.) To the left of the **Service Station** area, hold both webs of the carriage belt to maintain slight belt tension so that the carriage belt tensioner doesn't move out of place.

CAUTION

Make sure the belt is not twisted before attaching the clips.

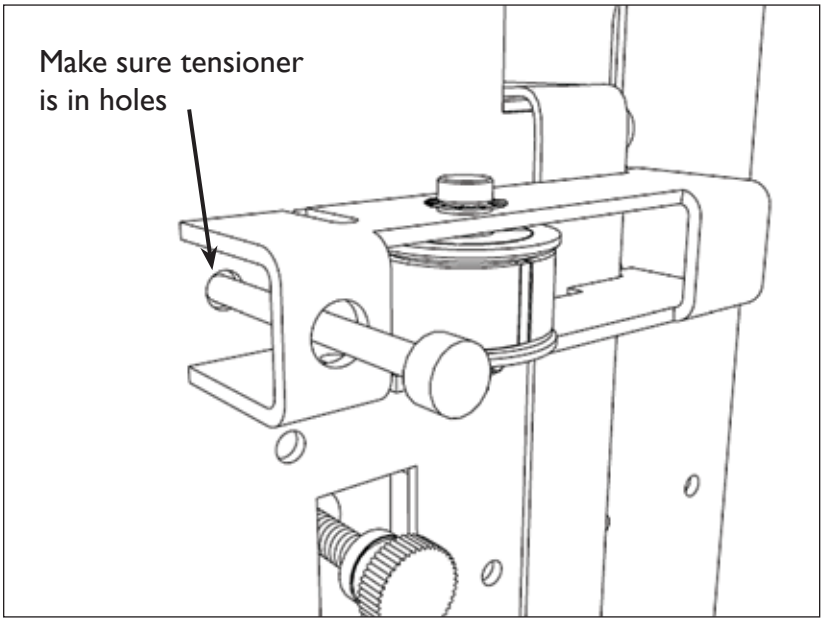


Figure 61. The carriage belt tensioner.

6. While maintaining tension on the carriage belt, attach the carriage belt clips to each side of the carriage base.
7. Tighten the carriage belt tensioner by rotating the $^{9}/_{64}$-in (3.5-mm) screw four, full clockwise turns.

Step 8: Install the carriage cover

1. Install the carriage cover by aligning it with the base and pushing back until the tabs by the belt ends grab onto the carriage base.
2. Press against the cover tabs to ensure that they 'snap' into the slots in the carriage base. (**Figure 62**.)
3. Install the #6-32 screw at the right side of the carriage cover.

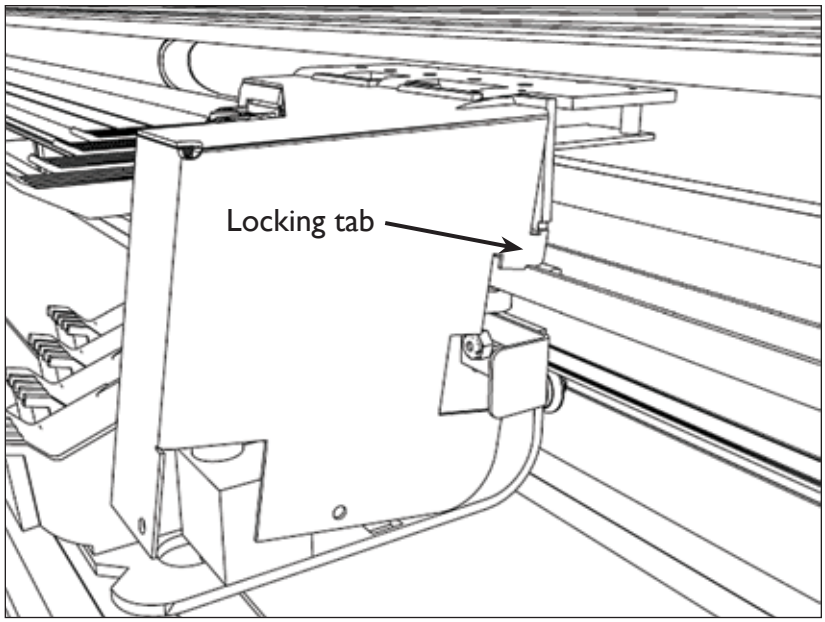


Figure 62. Install the carriage cover.

Note

The wrist ground strap can be removed now, but will need to be worn again later in this procedure.

Step 9: Secure and arrange the ribbon cable bundle - Part 1

1. Hold the ribbon cable bundle out of the way and attach a 10-cm piece of the supplied double sided foam tape to the traverse channel to the right of the existing tape (if present) at the middle of the machine. Remove the tape backing so that the side facing up is exposed.
2. Repeat this process near the right end plate, but place the tape to the left of the existing tape (if present). Remove the tape backing so that the side facing up is exposed.
3. Slide the carriage over to the left endplate and hold it in place. As the left side of the carriage just touches the small round bumpers, look at the ribbon cable bundle loop. It should leave a small gap of no more than .08-in (2-mm) between the sleeving and the left endplate where the carriage base touches the bumpers. (Figure 59.)
4. To the right of the carriage, hold the ribbon cable bundle down firmly in the traverse channel with the left hand.

Note

This process is important for proper operation of the FlexJet. The sleeved ribbon cables require a firm connection to the traverse at the middle of the printer and at the right end of the traverse. Leave existing foam tape if the pieces are still sticky and not bunched up. Apply the included foam adhesive tape to the existing foam tape if necessary.

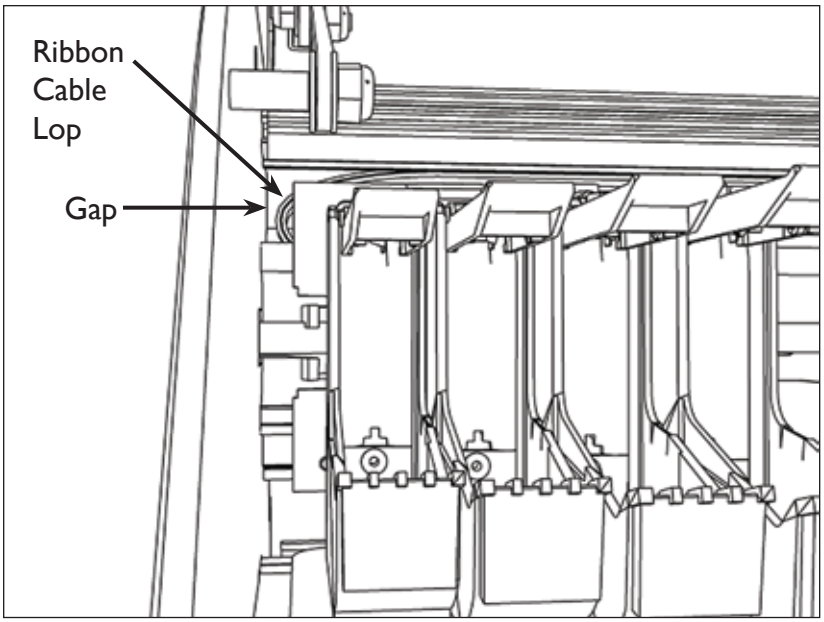


Figure 63. There should be a small gap in the ribbon cable loop.

5. With the right hand, smooth the ribbon cable bundle beyond the tape at the middle of the traverse so that the black sleeving is stretched and lays relatively flat and taut.
6. Firmly push the black sleeving into the tape at the middle of he traverse. If it does not stick, apply the supplied non-foam backed tape over the foam tape and repeat the process.
7. Move the carriage to the right 10 inches, then slide it back to the left end plate and ensure that the loop in the cable bundle is still not touching the left endplate. (**Figure 64**.)

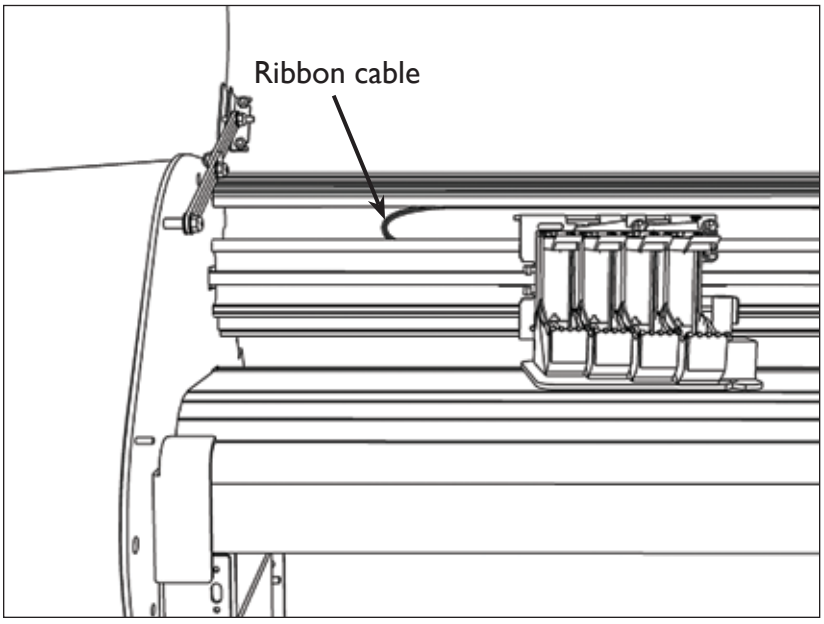


Figure 64. The loop in the cable should not touch the left endplate.

Step 10: Secure and Arrange the ribbon cable bundle—Part 2

1. Continue to smooth the ribbon cable bundle toward the right end plate to stretch the black sheathing so that it lays relatively flat and taut.
2. Firmly push the sleeving into the tape at the right end of the traverse. If it does not stick, apply the foam backed tape over the foam tape and repeat the process.

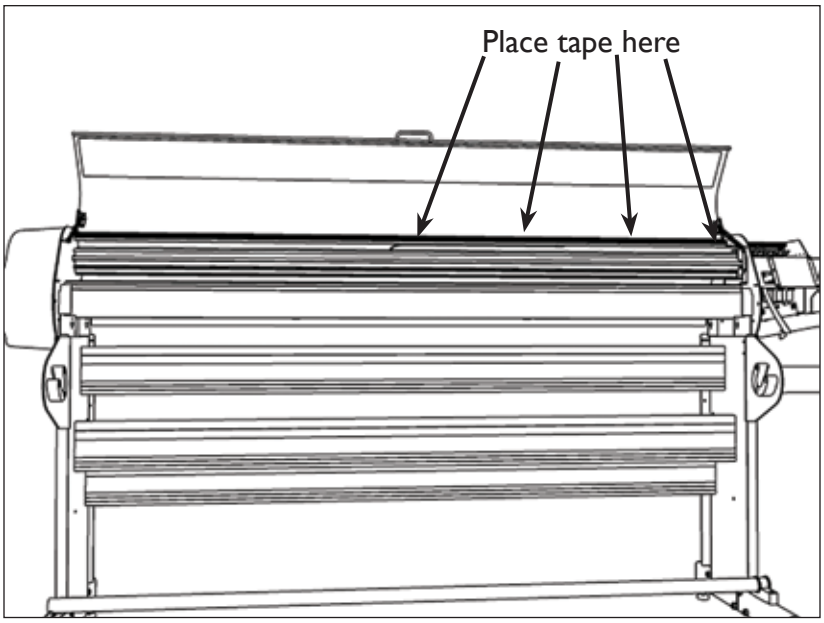


Figure 65. Secure the sleeving with tape.

Step 11: Connect the ribbon cables to the logic board

1. Plug the ribbon cables into the logic board in the correct order.
2. Tyrap the cables to the right end plate.
3. Verify that all connectors are properly plugged in. (*See* ***Figure 85***.)
4. Install the board cover, making sure to plug in the take-up wire connections to the board first. Make sure there are no wires or cables pinched between the cover and the body.
5. Install the right side plastic cover.
6. Connect the power and communication cables.
7. Test the machine for proper functioning. Press the arrows on the keypad to make sure all directions are working.
8. If problems arise call Ioline Customer Service.

Service station procedures

Y Fine adjustment for the Service Station

This procedure must always be done after replacing or upgrading the carriage assembly.

Tools Required

- Scotch tape
- Phillips screwdriver

Step 1: Service station centering

1. Remove power and communications cables and the right side cover. (**Figure 66**.)

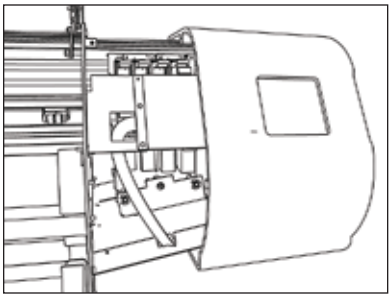


Figure 66. Remove the right end cover.

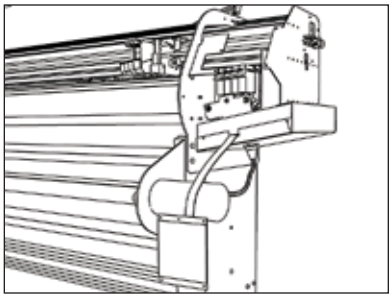


Figure 67. Remove the screws and let the keypad hang.

2. Remove the four Phillips screws that hold the keypad on. Let the keypad hang. Make sure both ends are still plugged in. (**Figure 67**.)
3. Remove the carriage cover. (One screw on the right side, unclip the back right and left sides. **Figure 68**.)

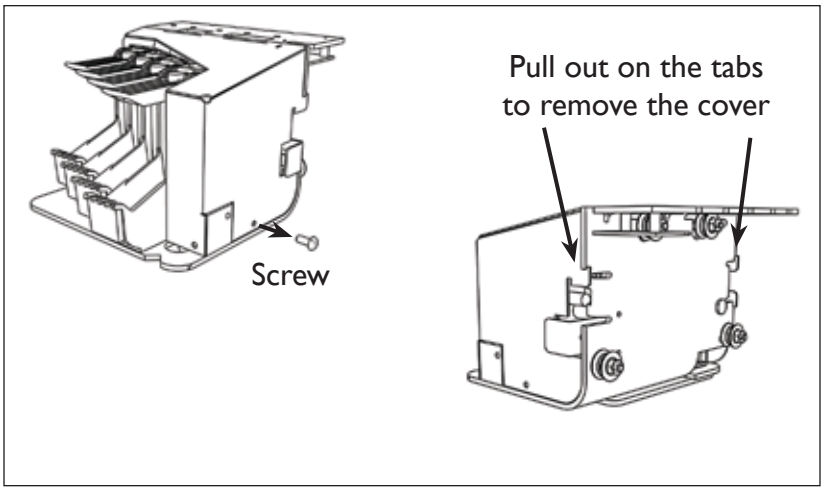


Figure 68. Remove the carriage cover.

CAUTION

The discharge of static electricity may damage the keypad and components. Use the included ground strap during all procedures. Keep plastic objects away from the keypad and logic board assemblies.

4. Make sure the ink cartridges are installed. Power the FlexJet on.

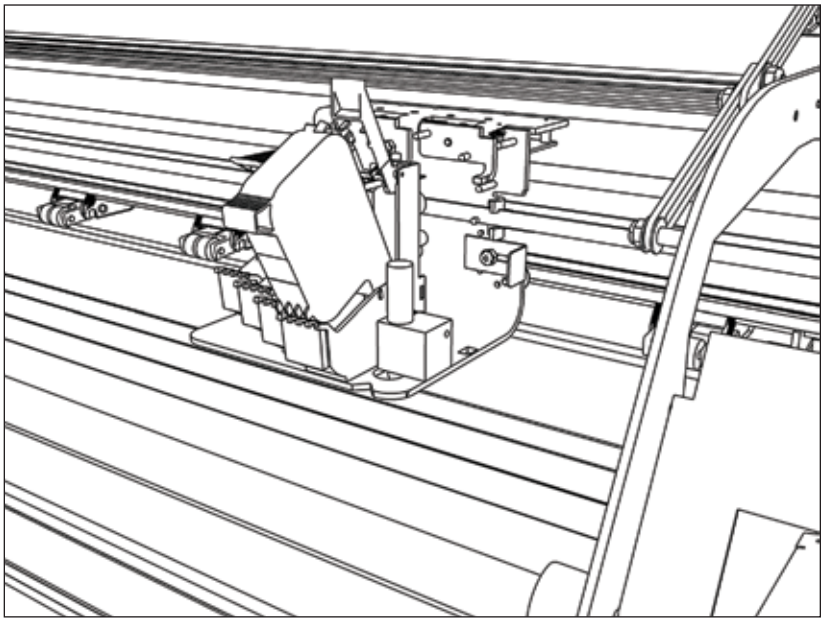


Figure 69. Install the ink cartridges and turn the power on.

5. Loosen (do not remove) the carriage catch bracket.

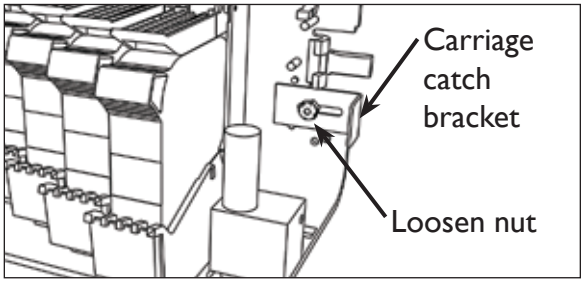


Figure 70. Loosen the carriage catch bracket.

6. Place a piece of (clear) scotch tape on the service station spit wells.

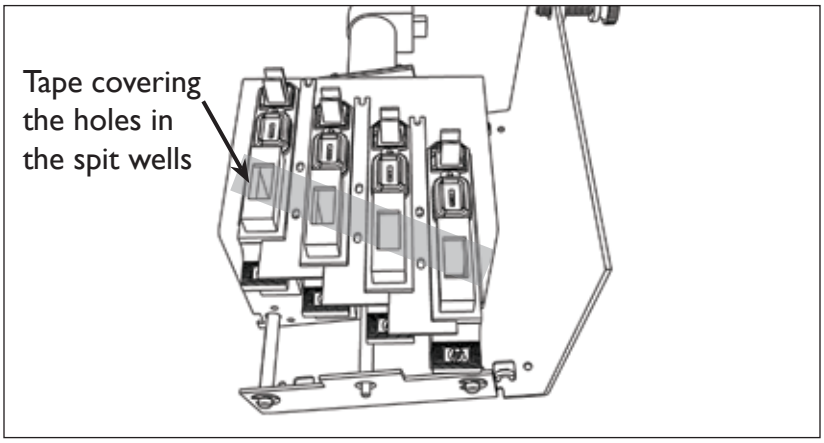


Figure 71. Cover the spit wells.

7. Press the "Clean" button on the keypad. You should see two lines in the middle of the spit well holes.

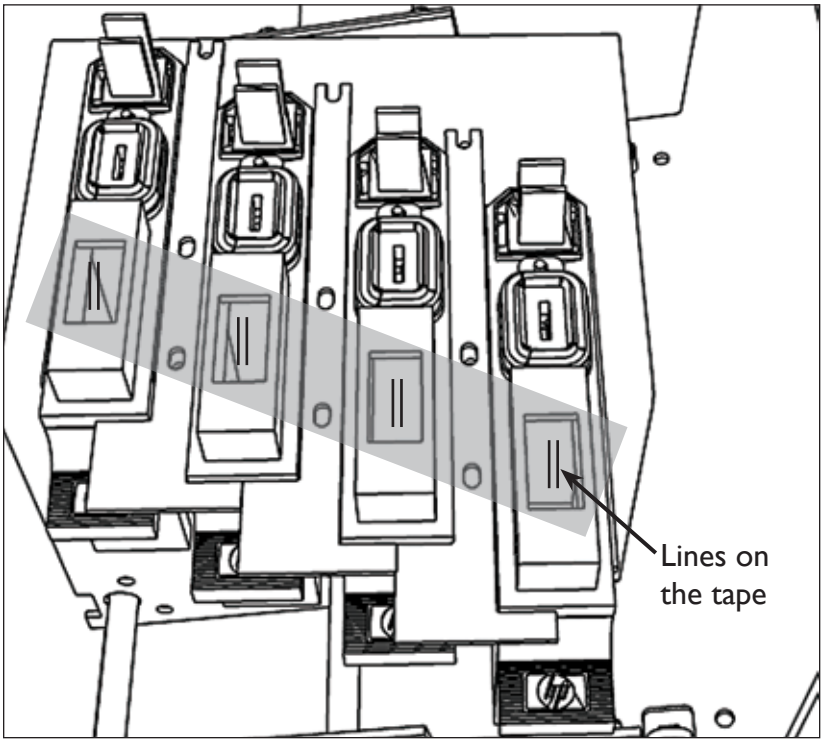


Figure 72. After you press the clean button, you should see two lines in the spit well holes.

8. If the lines don't appear in the middle of the holes, turn the plastic thumbscrew on the side of the service station (clockwise to move them left; Counter-clockwise to move the lines to the right.)

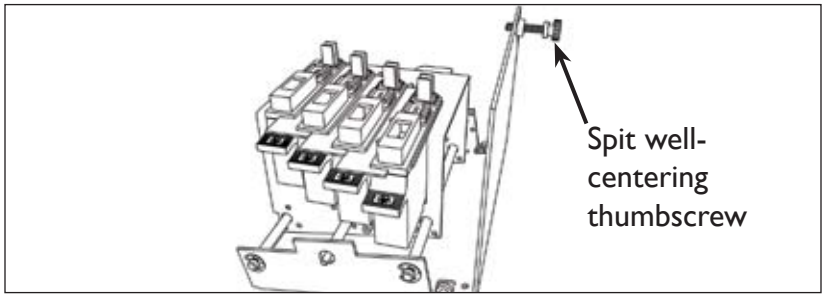


Figure 73. Use the plastic thumbscrew to adjust the lines if necessary.

CAUTION

After removing the ink cartridges, lower the blue ink doors before continuing.

9. Turn the power off, remove the ink cartridges and close the stall latches.

Step 2: Y Fine adjustment

The purpose of the Y Fine axis adjustment is to get the bottom of the carriage as close as possible to the ink wells without pressing too hard or leaving a gap. Also, proper adjustment assures the inkjet heads will be capped so they don't dry out.

1. Turn on the FlexJet and let it initialize.
2. Open the FlexJet **Control Center** software.
3. When the window opens press **Ctrl-Alt-B**. You should see the following window.

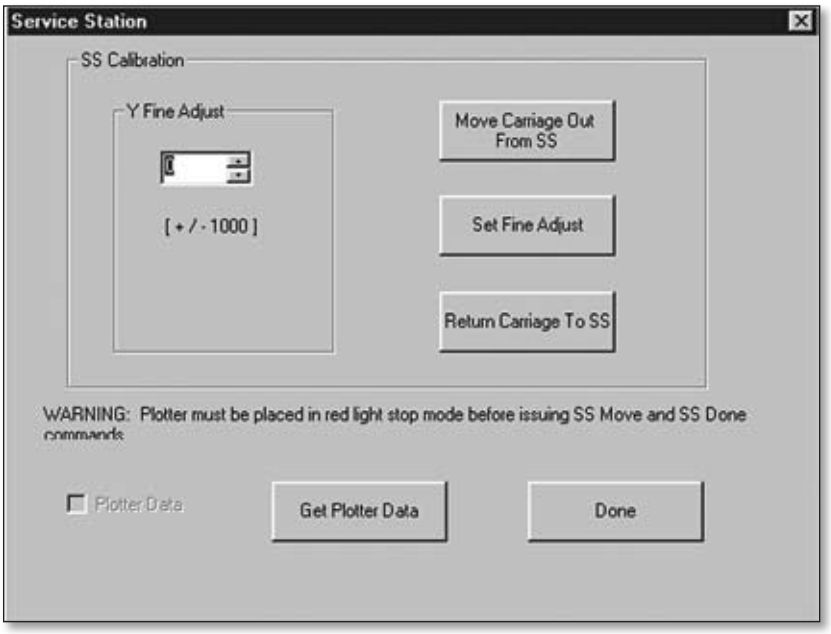

Service Station
SS Calibration
Y Fine Adjust
[+ / - 1000]
Move Carriage Out From SS
Set Fine Adjust
Return Carriage To SS
WARNING: Plotter must be placed in red light stop mode before issuing SS Move and SS Done commands
Plotter Data
Get Plotter Data
Done

Figure 74. Y Fine adjustment is performed within the **Control Center**.

4. Look at the gap between the bottom of the carriage and the **Service Station**. With the **Y Fine Adjust** set, there will be a large gap between the top of the grey ink wells and the bottom of the carriage.

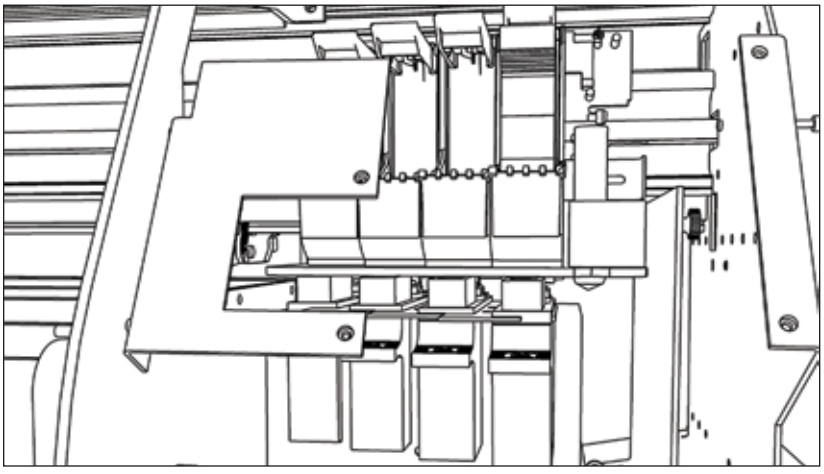


Figure 75. Watch the gap between the carriage and **Service Station**.

5. Click the ***Move carriage out from SS*** button. The carriage will move out of the **Service Station**.
6. Change the **Y Fine Adjust** number to -800 and click the **Set fine adjust** button.
7. Click on the **Return carriage to SS** button. The carriage will move back into the Service Station.
8. Follow steps 4 thru 6 again adding 100 to the **Y Fine Adjust number** each time until the bottom of the carriage is just close to touching the grey ink wells.
9. Reduce the gap further by adding smaller numbers.
10. Press and hold the **UP Arrow** on the keypad of the printer. While holding the button, turn the machine back on. When the carriage starts to move, let go of the button.
11. Once the carriage is back in the Service Station, check the gap one more time to make sure they are touching.

Step 3: Final screw adjustment

1. If you are happy with the spacing between the carriage and the Service Station, turn the service station stop screw on the side of the machine until it just touches the Service Station.

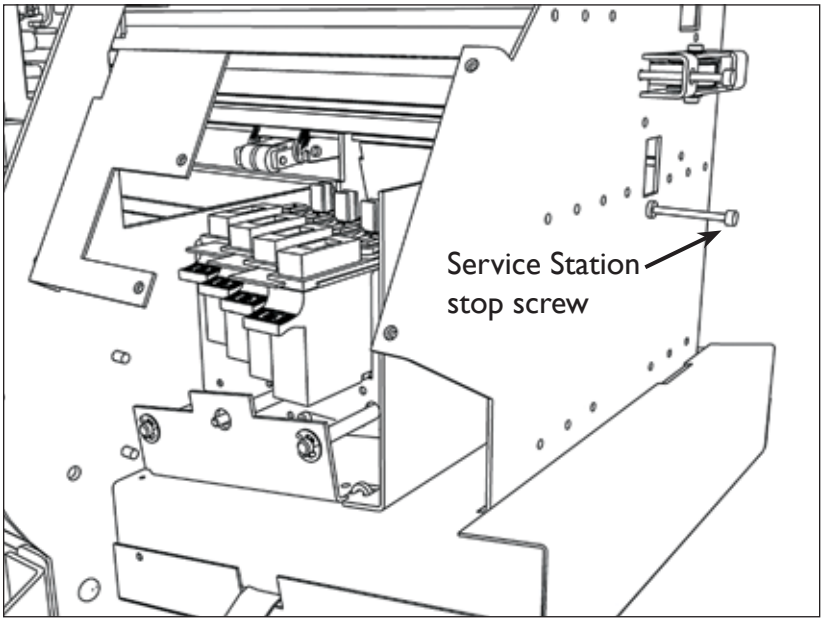


Figure 76. The **Service Station** stop screw.

2. Back the screw off one-half turn until you can see a little bit of light between the screw and the service station. Apply Loctite® or Super Glue® to the screw so it won't back out while the machine is running. (**Figure 77**.)
3. Move the carriage catch bracket until it hits the magnet. Tighten the nut to hold the stop bracket. (**Figure 78**.)

Note

A Y Fine Adjust change of 25 mils results in a gap change that is equivalent to the thickness of a piece of paper.

A Y Fine Adjust change of 100 mils results in a gap change of 18 mils.

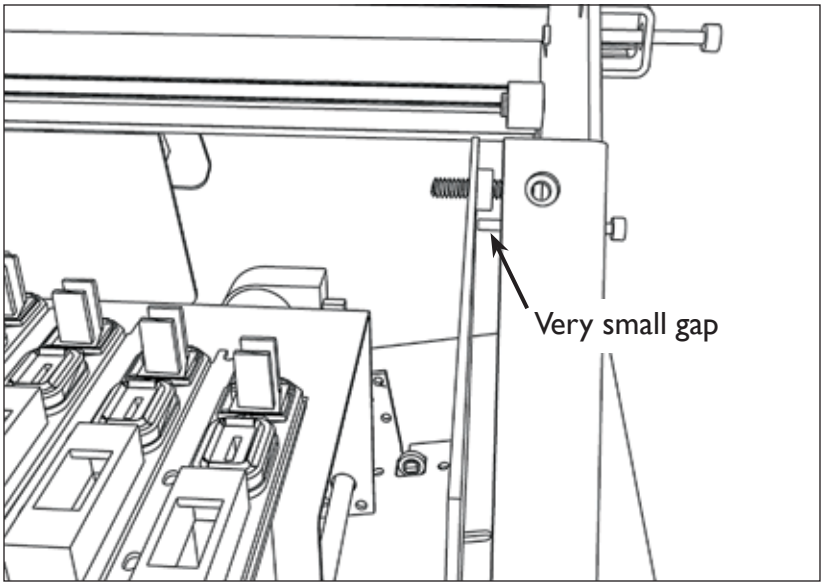


Figure 77. You should see a small gap between the screw and the **Service Station**.

Note

In **Step 3**, it's best to use a nut driver that can reach the nut while the carriage is in the service station. Otherwise tighten the nut enough to hold the bracket and move the carriage out of the service station to ???

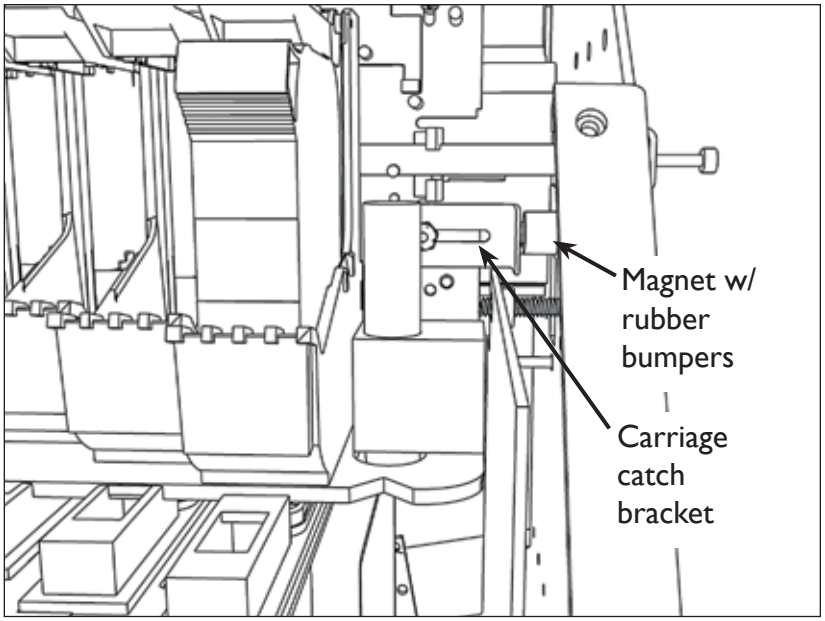


Figure 78. Tighten the nut to hold the stop bracket.

4. If you are happy with the adjustments, turn FlexJet power off.
5. Let the machine sit for 5 seconds, then turn the power back on.
6. When the carriage initializes into the service station check all the gaps and stop brackets to make sure the adjustments are still right.
7. Re-install the keypad. Run a test plot to the machine before putting the covers back on.
8. If problems arise contact Ioline Customer Service.

Logic Board Procedures

Logic board replacement

Tools Required:

- Phillips head screwdriver
- $^{5}/_{32}$-in Allen wrench

1. Unplug the take-up motor cable from the bottom of the machine. Unplug the power and serial cable. (**Figure 79**.)
2. Remove the right side cover of the machine. (**Figure 80**.)

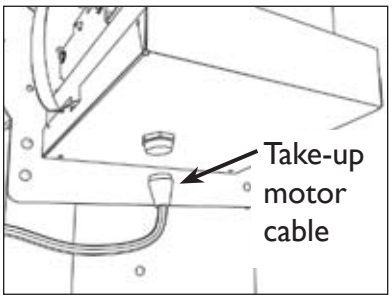


Figure 79. Unplug the take-up motor.

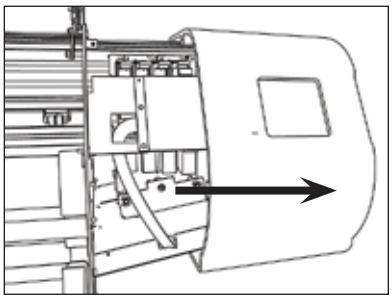


Figure 80. Remove the right cover.

3. Remove the four Phillips screws that hold the logic board cover on. (**Figure 81**.)
4. Make sure you are grounded with a static grounding strap. For now, leave the new logic board in its packaging. Remove the logic board cover on the FlexJet. Carefully unplug the take-up connector from the logic board before completelly removing the cover. (**Figure 82**.)

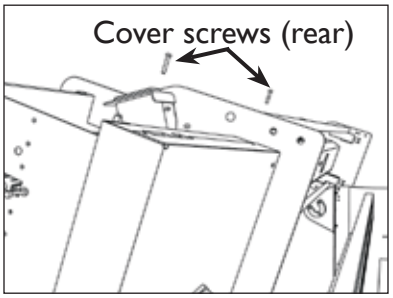


Figure 81. Unscrew the PCB cover.

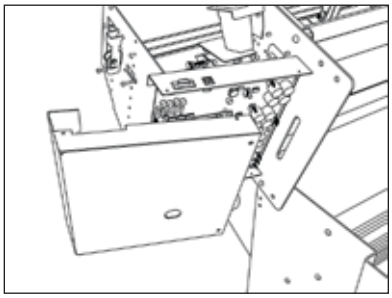


Figure 82. Remove the logic board cover.

5. Label the cables to make it easy to rematch during re-assembly. Carefully unplug the connections from the board. Remove the six silver phillips screws holding the board in the machine.

CAUTION

When removing the new logic board from the packaging make sure you have the static grounding strap on correctly. If there is a static discharge to the new board it may not function properly. The strap is included in the replacement kit.

Support the logic board hand when removing the last screw to prevent it from falling onto the floor. (**Figure 83**.)

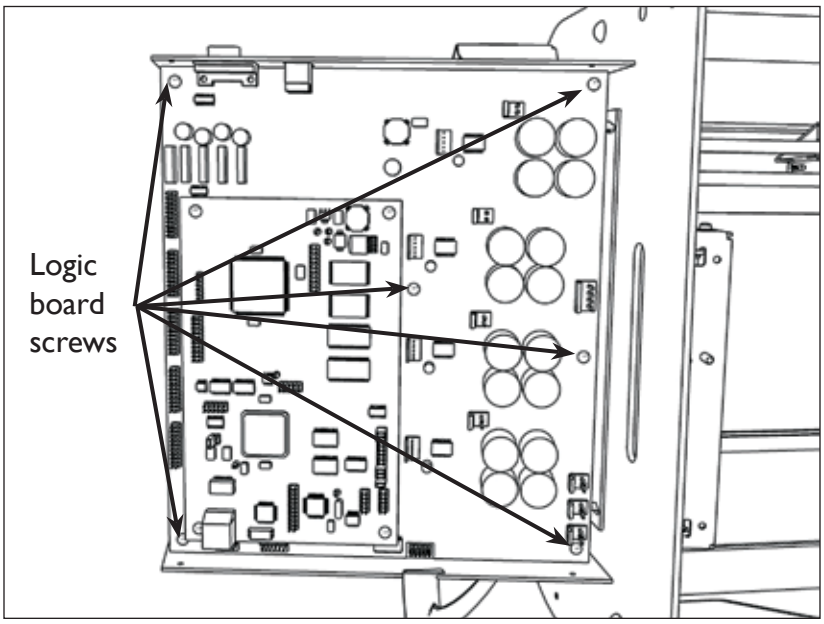


Figure 83. Carefully unplug connections to the board.

6. Pull the edge opposite the serial port out first. (Do NOT force it.) Then pull the PCB away from the rear so the serial port connection is not damaged.

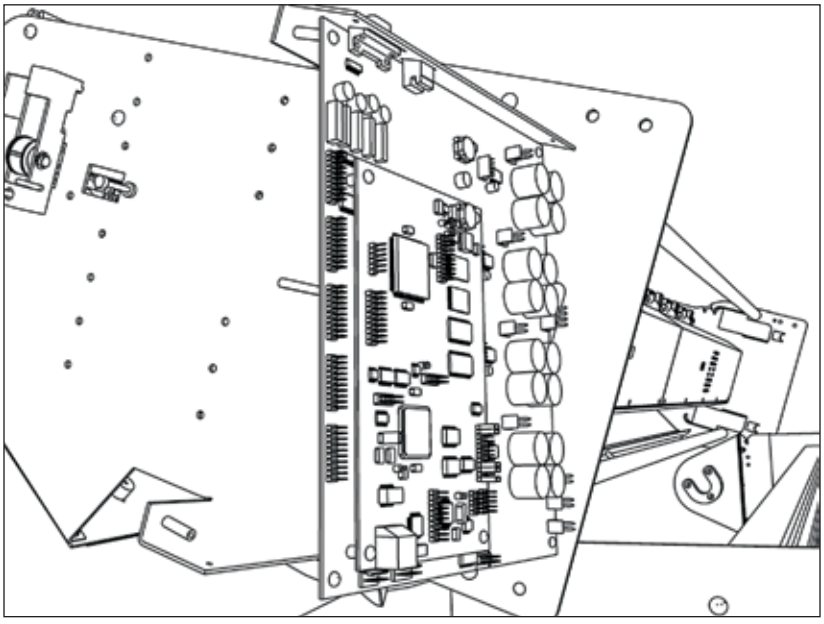


Figure 84. Carefully remove the logic board.

7. Remove the new logic board from it's packaging.

8. Install the new logic board into the machine. Carefully insert the serial port end into the holes in the metal bracket first. Tighten the six phillips screws that hold the board in making sure not to overtighten them.
9. Plug in all the wire connections to the board. Make sure the connectors are not off by a pin. (**Figure 85**.)

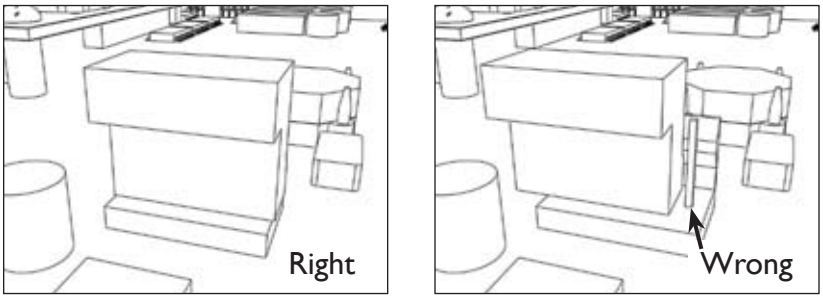


Figure 85. It's easy to miss a pin when plugging in the logic board. Inspect the connections to make certain the board is properly connected.

10. Install the board cover, making sure to plug in the take-up wire connections to the board first. Make sure there are no wires or cables pinched between the cover and the body.
11. Install the right side plastic cover.
12. Connect the power and communication cables.
13. Test the machine for proper functioning. Press the arrows on the keypad to make sure all directions are working.
14. If problems arise call Ioline Customer Service.

Note

If firmware is a lower number than version 253.2, use the Manual firmware update procedure

Updating the firmware

Step 1: Determine your firmware version number

1. Power on the PC and FlexJet.
2. Ensure that the serial cable connects the PC to the FlexJet.
3. Make sure there is a **Green** light on the keypad of the FlexJet and open the **Control Center**.
4. The main screen shows the current firmware version in the upper right corner.
5. If the firmware version is not shown, please check connections to the printer. Call Ioline Customer Service for help resolving communication issues.

Step 2: Manually set the initial Y Fine adjustment number

1. Turn on the FlexJet and let it initialize.
2. Open the **Control Center** software.
3. When the window opens press Ctrl-Alt-B. You should see the **Service Station** window.
4. Click the **Move carriage out from SS** button. The carriage will move out of the **Service Station**.
5. Change the **Y Fine adjust** number to -1000 and click the **Set fine adjust** button.
6. Click on the **Return carriage to SS** button. The carriage will move back into the **Service Station**.

Step 3: Auto updating firmware version 253.2 or higher

1. Make sure the firmware file has been saved in the **Ioline** folder. Choose ***File>Download Firmware*** from the menu.
2. Press the **Select Firmware** button.
3. Follow the on-screen directions that explain how to restart the printer so that it will accept new firmware. Press **OK** when the printer is ready (four yellow lights on the keypad).
4. Use the window to browse to the location where the firmware file is stored (usually ***xxxxx.mot***, where **xxxxx** is the version number).
5. A window will appear that shows the transfer progress.
6. The printer will go through the initialization process when the firmware is finished. When finished, the **OK** light will turn red and the **Square** light will turn green.
7. Press the **Done** button when the process is complete.
8. Follow steps for ***Y Fine Adjustment for the Service Station*** under the ***Service Station Procedures*** section of this chapter.

Keypad procedures

Keypad replacement

Tools Required
■ Phillips head screwdriver

1. Remove the right end cover.
2. Remove the four screws holding the logic board cover. Unplug the connector from the logic board and set the cover aside.
3. Remove the four Phillips screws holding the keypad to the bracket. Also remove the keypad bracket from the machine.

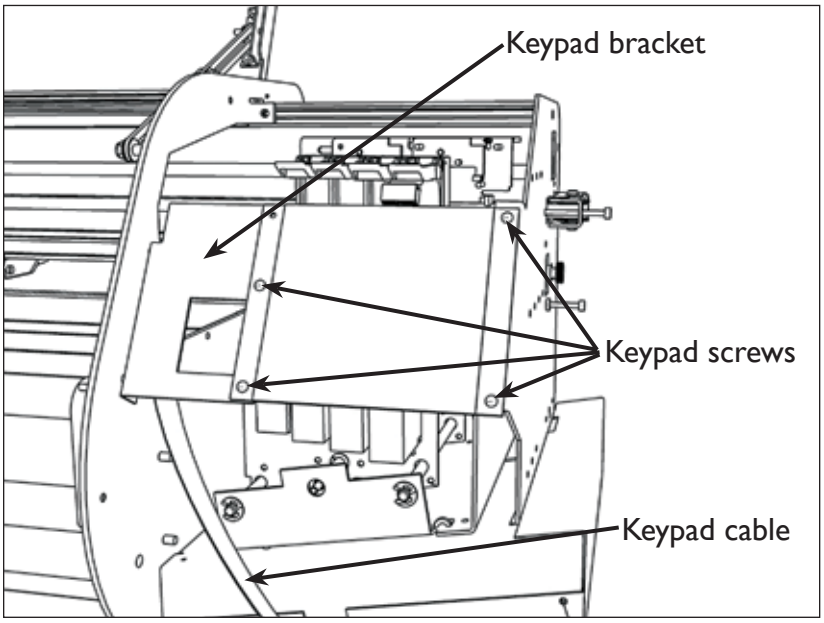


Figure 86. Remove the keypad screws and bracket. Unplug the keypad cable.

4. Unplug the keypad cable from the keypad and the logic board
5. Screw the new keypad and bracket to the machine and connect the keypad cable to the logic board. (Hold the keypad cable straight out from the keypad. The bottom lead in the cable should go to **Pin 1**.)
6. Test the machine to make sure the new keypad works.
7. Remove the old take-up connector from the bottom of the old logic board cover, and install it on the new cover.
8. Install the new board cover making sure to plug in the take-up wire connections to the board first. Make sure there are no wires or cables pinched between the cover and the body.
9. Re-install the right side cover if everything works.

Y-Axis procedures

Y-Axis transmission adjustment

This procedure covers tightening the setscrews on the Y-Axis transmission. If you are experiencing size or skipping problems while printing, follow this procedure as one possible fix.

Tools Required

- $^{5}/_{64}$-in Hex wrench

Tighten the setscrews shown on the Y-Axis transmission.

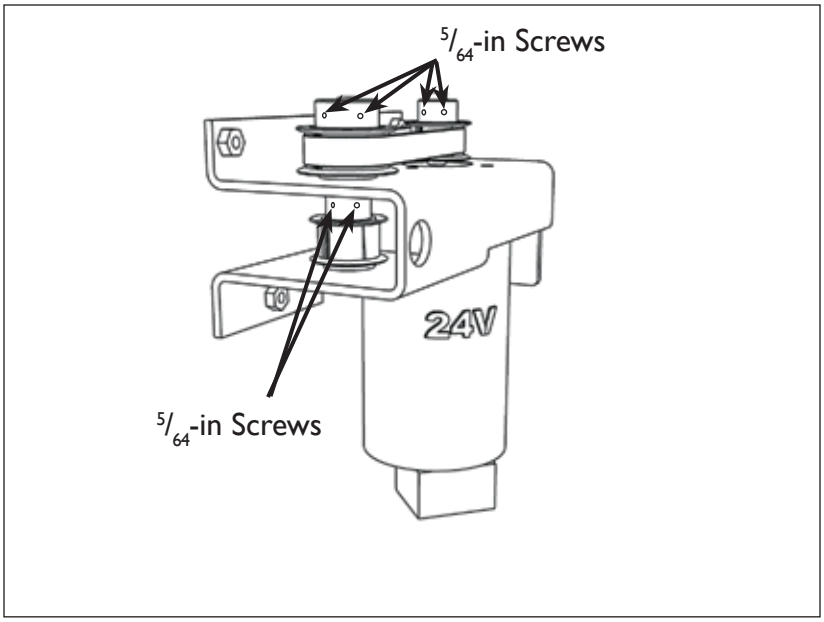


Figure 87. Try tightening the screws on the Y-Axis transmission if you see evidence of skipping problems on your plots.

Y-Axis belt adjustment

A y-belt that is too loose can cause belt tooth skip resulting in inaccurate plots. A y-belt that is too tight can generate excessive noise. Follow these steps to adjust the Y-axis belt tension.

1. Send a plot to the printer.
2. Hold the motor with one hand and using a screwdriver loosen the 3 screws that attach the motor to the transmission bracket.
3. Pull the motor to tension the belt. Excessive tension will create a loud whining noise. Tension the belt so that the transmission sounds quiet, does not whine, and the belt teeth smoothly engage the pulley teeth.
4. Securely tighten the 3 motor screws.

CAUTION

The following steps involve machine adjustment during printer operation. Keep fingers and loose clothing away from the y-motor transmission.

X-Axis procedures

If you are experiencing variable frame gap or shifting of the paper in the Y direction this may indicate that the motor or driveshaft pulley setscrews have loosened or that the belt tension is too low. Using a 1/16-in Hex wrench, tighten the 2 setscrews per pulley. Make sure that the motor pulley has one setscrew tightened onto the flat area of the motor shaft. The belt tension can be adjusted by loosening the 3x motor screws, pushing the motor pulley to adjust belt tension and then retightening the screws.

This page intentionally left blank.

FlexJet BOM (Bill of Materials)

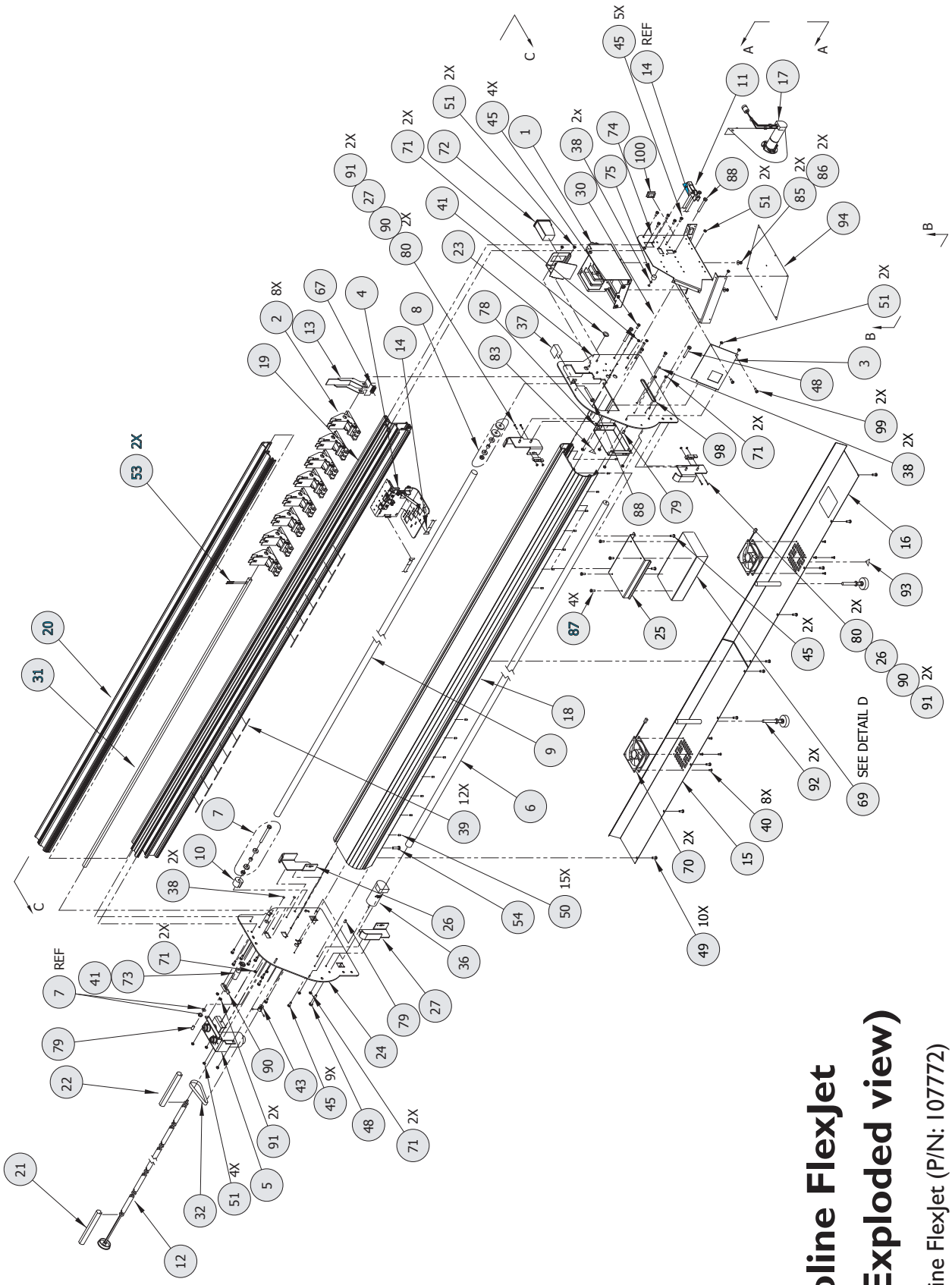
Part Number	Description	SEQN	QTY
107758	SERVICE STATION ASSY, FJ	1	1
107215	PINCHWHEEL ASSY, 6 LB, 1:1, PLASTIC	2	8
108495	KEYPAD ASSY, FJ	3	1
108270	CARRIAGE ASSY, FJ, FRAME-UP	4	1
108227	ASSY,Y TRANS, GT	5	1
107588	TOP BAR ASSY, 600/28AE	6	1
107700	SUPPORT ASSY,TOP BAR, LEFT	7	1
107701	SUPPORT ASSY,TOP BAR, RIGHT	8	1
107590	SHAFT,TOP BAR, 600/28AE	9	1
107698	SPACER, C-SHAPE, 10 OD, .25ID	10	1
106708	TENSIONER ASSY, SC98	11	1
107699	DRIVE SHAFT ASSY, INK-JET	12	1
106684	LEVER ASSY, PINCHWHEEL, REAR	13	1
108225	Y BELT ASSY, GT, 3MM PITCH	14	1
107830	COVER ASSY, BOTTOM, LEFT	15	1
107833	COVER ASSY, BOTTOM, RIGHT	16	1
108305	TAKE-UP ASSY, RIGHT, FJ	17	1
107697	PLATEN, FLEX JET	18	1
107828	TRAVERSE, FLEXJET	19	1
108264	DUST COVER, FJ	20	1
108201	SPACER, DRIVESHAFT, PL, 8.6LG	21	1
108202	SPACER, DRIVESHAFT, PL, 9.3LG	22	1
107774	PLATE, END, RIGHT, FJ	23	1
107775	PLATE, END, LEFT, FJ	24	1
107886	BRACKET, POWER SUPPLY, 5X9	25	1
108252	CHANNEL,TOP, RIGHT, FRONT	26	2
108251	CHANNEL,TOP, LEFT, FRONT	27	2
108349	COVER, LOGIC BOARD, FJ	28	1
106845	SHAFT, CAM, I/S 600	31	1
106550	BELT, .080 X 1/4 X 100T	32	1
100279	CONN, CABLE CLIP	33	10
103026	CONN, CABLE CLIP, .18 DIA	34	3

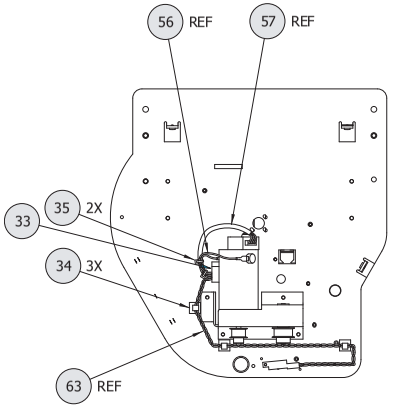
Part Number	Description	SEQN	QTY
103027	TYRAP, .1 IN X 5 3/4 LG	35	30
106816	MOTOR, SERVO, 24V	36	1
103740	TAPE, FOAM, .5 IN, .025 THICK	37	1
100705	PAD, PEN CAP, 1/4 DIA	38	6
106649	LABEL, DRIVE AREA	39	12
106652	RIVET, PLASTIC, .2 GR X .169 OD	40	8
106693	BUSHING, NYLON,.52ID, .62OD, .75FL	41	2
105933	PULLEY, 16T X .080 X 1/4	43	1
104180	SCREW, #8, .50 LG, SLF TAP, PHP, SE	45	18
105514	SCREW 1/4-20, 1.75 LG, BTM HD SOCK	48	2
104590	SCREW #8, .50 LG, ST, FHP	49	10
102726	SETSCREW #10-32, .75 LG, STEEL	50	15
104013	NUT, #8-32, KEP	51	10
107211	COTTER PIN, 1/8 X .75	53	2
102281	SCREW #10-32, 1.0 LG, PHP	54	1
107850	CABLE ASSY, MOTOR, X, IJ02	55	1
107852	CABLE ASSY, MOTOR, Y, IJ02	56	1
107853	CABLE ASSY, ENCODER, LONG, IJ02	57	2
107854	CABLE ASSY, MTR/ENC, TU, IJ02	58	1
107856	CABLE ASSY, MOTOR, SS, IJ02	59	1
107857	CABLE ASSY, ENCODER, SS, IJ02	60	1
107859	CABLE ASSY, TU SENSOR, IJ02	62	1
108328	PROC, INST, FJ PCB ASSYS	63	1
107861	CABLE ASSY, FAN, SHORT, IJ02	64	1
107862	CABLE ASSY, FAN, LONG, IJ02	65	1
107864	CABLE ASSY, POWER, DC, IJ02	66	1
106951	SPRING, TORSION, .53 ID, .045 WIRE	67	1
108496	POWER SUPPLY, CALIBRATED, 30V	69	1
108177	FAN ASSY, 24-48 V, W/CONN	70	2
104717	NUT, #10-32, HEX, NYLOCK	71	8
108192	POWER ENTRY ASSY, AC, FJ	72	1
107849	CAP,VINYL, .437"D X 1.5"L	73	1
108350	RAMP, STATION, FJ	74	1
108242	MAGNET, NEO, .5 OD, .375 LG	75	1
108074	COVER, WIRE, FJ	78	1
106750	CAP,VINYL, .093 ID, BLK	79	2
103260	SCREW #4-40, .75 LG, PHP	80	4
108314	FERRITE, MOTOR ENCODER, FLEXJET	82	4
105930	LABEL, WARNING, CRUSH HAZARD	83	1
108316	FERRITE, MOTOR POWER, FLEXJET	84	4
107502	WSHR, .500 OD, .145 ID,.031 T, PTFE	85	2
106532	NUT, #6-32, HEX, NYLOCK	86	2
100020	SCREW #6-32, .187 LG, PHP	87	4
100046	SCREW #8-32, 1.25 LG, SHC, FULL THD	88	2
107738	SENSOR, OPTICAL	90	2

Part Number	Description	SEQN	QTY
101601	NUT, #4-40, HEX, THIN NYLOCK	91	6
102219	LEVELER, 1.5 PAD, 3 IN ADJUST	92	2
108271	SHIELD, LOGIC BOARD, FJ	94	1
104471	TAPE, UHMW, .43 WIDE	96	2
103726	TYRAP, .1 IN X 3 IN, BLACK	97	4
104726	GROMMET STRIP, CONTINUOUS 7/64	98	9
108453	CAP, ETHERNET PORT	100	1
106528	TAPE, DOUBLE COATED, 1.25 W	101	1
102220	NUT, #3/8-16, HEX	102	2

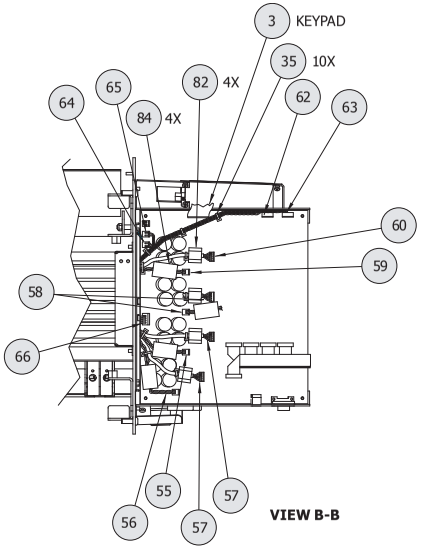
Ioline FlexJet (Exploded view)

Ioline FlexJet (P/N: 107772)

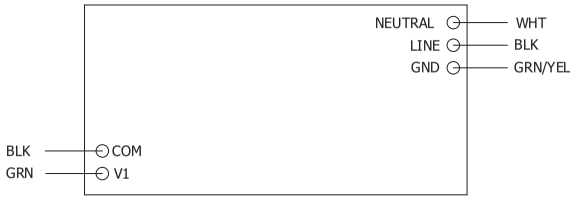




VIEW A-A

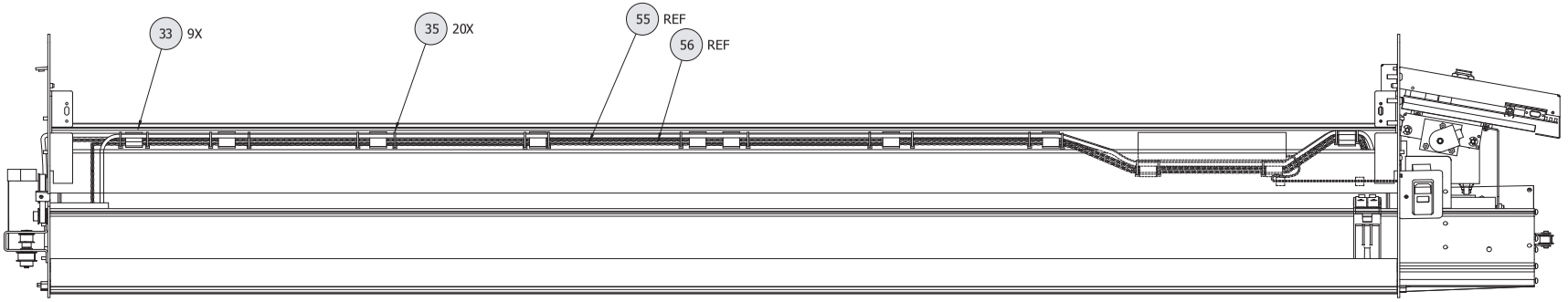


VIEW B-B



POWER SUPPLY WIRING

DETAIL D



VIEW C-C

Ioline FlexJet (Electronics view)

Ioline FlexJet (P/N: 107772)

This page intentionally left blank.

INDEX

Symbols

40x8.plt 47

70x8.plt 47

A

Active print cartridges 26

Adobe® Illustrator® 19

Assembly xv
- Lifting technique *xiii*

ASTM 19, 23

AutoCad® 19

B

Baud rate 26, 27, 34, 37, 41

Belt tensioner 64, 67, 68, 69, 72, 73, 74

Best mode 20, 28

Bill of Materials 22, 91–93

BOM—*See* Bill of Materials

Bottom Pan 22

C

Cable Replacement 69–76

Cables
- Power cord 24, 41

Calibration 25, 26, 46–48
- Cartridge alignment 46, 47
- Frame gap 46
- Motion adjustment 46, 48
- Size 26

Carriage xviii, 21, 22, 24, 25, 27, 30, 32, 36, 38, 39, 44, 61, 63, 64, 66, 67, 69, 72, 73, 74, 78, 82
- Assembly 32
- Close-up view *xviii*
- Latch 32
- Magnetic stop plate 32
- Notched 'V'—*See* Set origin
- Red light alignment indicator 32
- Replacement 63–68
- Stall xviii

Carriage latch 32

Carriage rail—*See* Traverse

Carriage stall 32

Carriage stop adjustment screw 30

Carriage swing arms 67

Cartridge "Spit" wells 30

Cartridge Caps 30

Cartridges—*See* Ink cartridges

Cartridge wipers 30

Clean 40, 44

Clipping 27

Communications
- Baud rate 26, 27, 37, 41
  - Data bits 37
  - Flow control 37
  - Parity 37
- Conflicts 25
- Errors 34–35
- Get plotter data 27
- Ports—*See* Serial port, USB
- RS-232 20, 21
- Send Command 26
- Settings 26

COM port 26, 27, 37—*See also* Communications

Consumables
- Paper
  - Proper paper path 42

Control Center xv, 24, 25, 26, 27, 37, 38, 39, 40, 46, 47, 80, 86
- Cartridge calibration 26

Cartridge count 27
Download firmware 26
Error messages 34–35
Exit 26
Frame size 27
Get plotter data 27
Help about 26
Installation 24
Line width 27
Main Menu **25**
Measurement units 28
Menu Bar 26
Menu Options 27
Quality setting 28
Reset machine ID 26
Scale 27
Screen Menu 25
Send command 26
Send plot file 26
Set key code 26
Set machine ID 26
Settings 26
Size calibration 26
Software version 27

Control panel—*See* Keypad

Conversion 23

CorelDraw!® 19

Covers xvi

Cross-member xvii

Customer service 59
Contact information 59

D

Dancer bar
Front dancer bar 42
Insertion **19**, **21**, **29**, **30**, **31**, **32**
Rear (heavy) dancer bar 42

Data bits 37

Design software 22, 27, 37, 38, 41

DM/PL 19, 20, 22, 23

Draft mode 20, 28

Drive shaft 39, 43

Drive shaft marker xviii
Location **xviii**

DXF 19, 20, 23

E

End covers xvi

Error codes
Firmware update 36
Keypad errors 36

Error messages 33

F

Feed roll xvi, 42

Feed shaft xvi, 40

File formats 22, 23

Files
Conversion 23
Download firmware 26
File name extensions
EPS 26
PLT 26
PLX 26
Plot file adjustments—*See* Control Center
Send plot file 26

Firmware 26, 34, 86
Software version 27
Updating 26, 35

FlexJet
Connections 37
Front close-up *xviii*
Front View *xvi*
Pre-wiring for expansion 26
Rear view *xvii*
Settings 27
Start-up process 24

FlexJet Control Center—*See* Control Center

FlexJet Quick Start Guide xv, 39, 43

FlexJet User Guide xiv, 42, xv, 38, 43, 44, 46, 49

FlexPlot xv, 19, 22, 23, 24, 37
Installation 24
Workflow using CAD software **23**
Workflow with FlexPlot **23**

FlexPlot User Guide xv, 22, 24

Flow control 37

Foot
Platen leveling foot close-up xvii
Stand leveling foot close-up xvi

Frame gap 38, 40, 46, 48, 49

Frame length 41

Frame size 27

Front dancer bar 42

Front top bar 42

Fuse holder 51

G

Gerber® 19, 20

Get Plotter Data 27

Gray bars xiii
- Lifting by gray bars **xiii**

Grease 40

Green light mode—*See also* START Mode

H

Help 58–60

HPGL 19, 20, 22, 23

I

Ink cartridge motion 21

Ink cartridges—*See* Ink cartridges
- Active 27
- Calibration 26, 46–48
- Calibration & alignment 26
- Cartridge count 27
- Cartridges in stalls **xviii**
- Cartridge stall latch xviii
- Cartridge stall problems 50
- Ink level indicator 40, 44
  - Empty cartridge **44**
- Maintenance and handling 44
- Stalls xviii
- Upgrading number of stalls 26

Investronica® 19, 20

Ioline Corporation 59

IPS software 19

J

K

Keypad 24, 25, 36, 40, 44
- Clean 40, 44
- Error codes 36
- Lights
  - LED lights **36**
  - OK light 24, 25, 37
  - Square light 24, 25, 37
- Page advance 37
- Set origin 38, 39
- Start/Stop 44

L

Lectra® 19, 20

LED error codes 36

Left end cover xvi

Leveling foot xvi, xvii

Leveling pads—*See* Leveling foot

License key code 26

Limit of liability statement xiv

Line quality—*See* Printing Quality

Line width 20, 25, 27, 28—*See also* Printing Quality

Logic board 26, 31, 53, 54, 55, 61, 62, 63, 69, 70, 71, 77, 83, 84, 85, 87
- Changing 26
- Fans 31
- Rev 1 31
- Rev 2 31
- Ribbon cable socket 31
- Troubleshooting 55–57

logic board 76

Loss of registration between frames 38

M

Machine ID 26

Main Power 31

Maintenance xv, 38, 40, 43, 44

Markers
- Length 20
- Removing xv
- Scale—*See* Control Center

Measurement Units 28

Media 43
- Paper type 20
- Tracking 43
- Width 20

Media tracking 40

Menu
- Control Center 26

Motor xvi, 21, 31, 52, 54, 55, 63, 69, 71, 83

N

O

OK light 24, 25, 37

Operating system 24

Optical sensor—*See* Sensor

Optitex® 19, 20

Origin 36, 38, 39

P

PAD® 19, 20

Page advance 37

Paper hub xvi

Paper jams—*See* Troubleshooting

Paper loading xv

Paper motion 21

Paper Out Sensor 52

Paper path 39, 42
- Correct feeding path **42**, **44**, **45**, **46**, **47**, **48**, **49**, **50**, **51**, **52**, **54**, **61**, **64**, **65**, **66**, **67**, **68**, **69**, **70**, **71**, **72**, **73**, **74**, **75**, **76**, **77**, **78**, **79**, **80**, **81**, **82**, **83**, **84**, **85**, **87**, **88**

Paper sensor 39

Parity 37

Pinchwheel
- Assembly 30
- Location of **xviii**

Pinchwheel lever xviii, 42
- View from front **xviii**

Platen xvii, xviii, 39, 42

Platen leveling foot xvii

Plot 22, 28, 39, 40, 43
- Adjustments with Control Center 25–27
- Frame 27, 38, 40
  - Frame size 27
- Line width 25, 27, 28
- Scale 25, 27
- Sending to printer 25
- Send Plot File 26
- Setup 22–23
- X-axis 27
- Y-axis 27

Plotter Data 27

Plotting pens—*See* Ink cartridges

Plotting quality—*See* Printing quality

PLT 19, 26

Polytropon® 19, 20

Power cord 24, 41

Power panel assembly 29

Power requirements 20

Power supply 29

Power switch xvii, 24

Pre-wiring for expansion 26

Printer settings 24, 25, 26, 27, 37, 38, 39, 40
- Max. plotting width 20
- Resolution 20

Printing
- Page advance 37
- Quality 28
- Queue management 23
- Recommended software 22
- Removal—*See* Unroll
- Send plot files to printer 26
- Workflow 22–23
  - Using CAD software **23**
  - Using FlexPlot **23**

Q

Quality—*See* Printing quality

Queue management 23

R

Rear dancer bar 42

Red light alignment indicator 32

Repair xiii, 58
- Cable replacement 69–76
- Carriage replacement 63–68
- Diagnostic Record 62
- Diagnostics flow chart 61
- Factory authorization xiii
- Firmware updates 86
- Keypad procedures 87
- Logic board procedures 83–86
- Requesting service 62
- Service Station procedures 77

Requesting service
- Diagnostic record 62

Reset Machine ID 26, 35

Resolution 20

Right end cover xvi

Roll feed motor 63, 69, 71

S

Safety
- Lifting printer by gray bars **xiii**
- Safety precautions xiii
- Unpacking 63, 69

Safety cover xvi

Scale 27

Scanvec® 19, 20

Screen menu options—*See* Control Center

Send Command 26

Send plot file 26

Sensor xviii, 52–53
- Replacing 53

Serial communication—*See* Communications

Serial number xiv, 21, 26
- Set Machine ID 26

Serial port xiv, xvii, 21, 26, 37, 83, 84, 85, 86
- Cable 21
- Location on logic board 31

Service—*See* See Repair

Service Station xviii, 24, 36
- Assembly 30
- Encoder 31
- Motor power 31

Set Key Code 26

Set Machine ID 26

Set origin 38, 39

Shaft xvi, xviii, 42

Size calibration 26

Software—*See also* The FlexPlot User Guide
- Apparel design software xv, 22, 27, 37, 38, 41
- Compatibility 20
- Control Center 24, 25, 26, 27, 37, 38, 39, 40
- FlexPlot 22, 23, 24, 37
- Setup 22

Software errors 34–35

Software version 27

Specifications xv, 20, 37

Square light 24, 25, 37

Stall xviii

Stand xvi
- Cross-member xvii

Stand leveling foot xvi

Start/Stop 44

STD 19, 20, 23

Support 58

Support block xvi

T

Take-up encoder 31

Take-up motor xvi, xvii

Take-up motor cable xvii

Take-up motor outlet xvii

Take-up Sensor xviii, 31—*See also* Sensor

Take-up shaft xvi, 42

Tech Support 59

Terminal program 37

Timing belt 21

Tools 26, 46, 63, 69, 77, 83, 87, 88, 101

Tracking 40

Transistor 52, 54

Traverse xviii, 21, 22, 39, 40, 43, 50, 55, 65, 66, 69, 72, 73, 74, 75, 76

Traverse Assembly 22

Treads 43

Troubleshooting xv
- Alignment issues 39
- Chart of common problems 38–41
- Communications 37
- Error messages 33
- Ink cartridge bay problems 50
- Keypad error codes 40
- Logic board 55–57
- Loss of registration between frames 38
- Mechanical, electrical, and electronic diagnostics 51
- Media tracking 40
- Noisy carriage movement 50
- Paper problems 42
- Paper tears 39
- Power problems 37, 41
- Printing quality 38–39, 44–45
- Scan gaps 40
- Sensors 52
- Software errors 34–35
- Speed 41

U

USB xvii, 20, 21
- Cable 21

V

W

Warranty xiv, 20

Windows 24

Workflow 22, 23

X

X-Axis 22
- Logic board encoder 31
- Logic board motor power 31

X-Axis Procedures 89

Y

Y-Axis 21, 22, 54, 88
- Logic board encoder 31
- Logic board motor power 31

Y-Axis belt adjustment 88

Z